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Vol. 971 Number 2

OFFICIAL GAZETTE

of the UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 13, 1978

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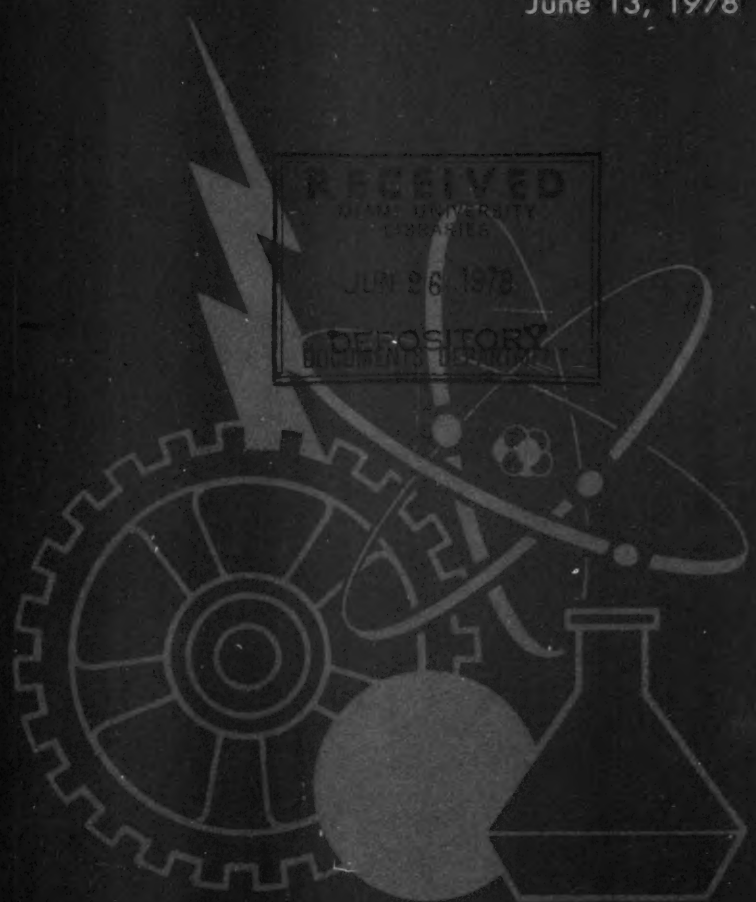

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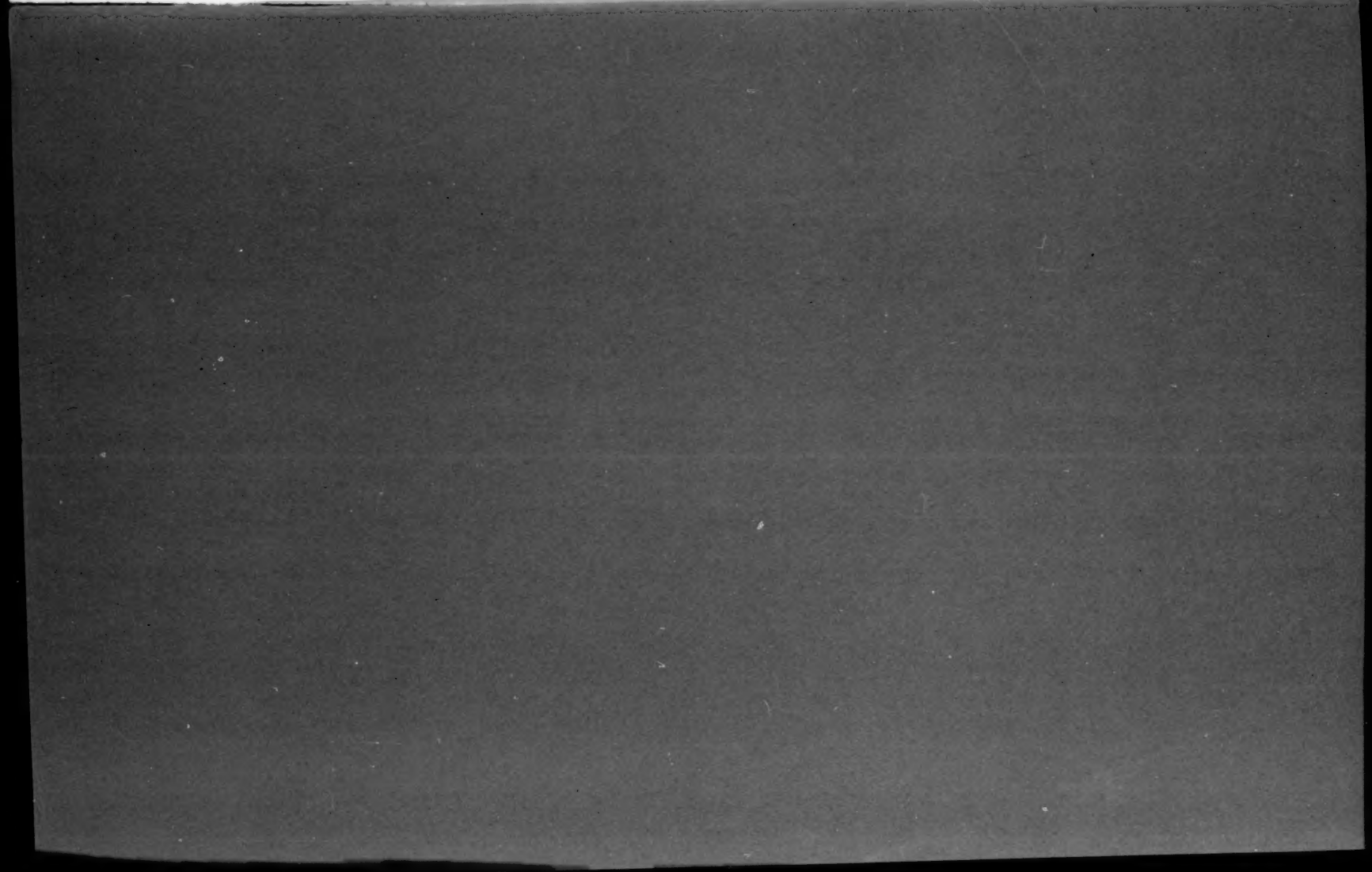

OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) Implementation: Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of May 16, 1978.

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

May 2, 1978.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,019,527, Re. S.N. 893,482, Filed Apr. 4, 1978, Cl. 137/115, MODULATING FLOW CONTROL VALVE, Warren H. Brand, Owner of Record: *Yarway Corporation, Blue Bell, Pa.,* Attorney or Agent: Thomas M. Ferrill, Jr., et al., Ex. Gp.: 341

4,035,197, Re. S.N. 885,050, Filed Mar. 9, 1978, Cl. 136/89 CD, CDTE BARRIER TYPE PHOTOVOLTAIC CELLS WITH ENHANCED OPEN-CIRCUIT VOLTAGE, AND PROCESS OF MANUFACTURE, Pranab K. Raychaudhuri, Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: Dana M. Schmidt, et al., Ex. Gp.: 114

4,057,717, Re. S.N. 896,953, Filed Apr. 17, 1978, Cl. 364/802, TRANSFORMER WITH ACTIVE ELEMENTS, Michel V. Ferry, Owner of Record: *International Business Machines Corporation, Armonk, N.Y.,* Attorney or Agent: Maurice H. Klitzman, et al., Ex. Gp.: 236

PATENT NOTICES

Certificates of Correction for the Week of June 13, 1978

Re.29,383	4,031,127	4,055,370	4,067,369
Re.29,474	4,032,430	4,055,386	4,067,454
Re.29,543	4,033,871	4,055,466	4,067,667
D.237,434	4,033,881	4,055,684	4,067,711
D.245,999	4,034,850	4,056,326	4,067,903
3,665,007	4,035,196	4,056,424	4,068,017
3,680,696	4,035,878	4,056,536	4,068,051
3,781,936	4,036,416	4,056,712	4,068,069
3,793,279	4,036,963	4,056,970	4,068,086
3,867,365	4,037,288	4,057,763	4,068,094
3,893,682	4,038,605	4,058,312	4,068,136
3,911,242	4,039,401	4,058,494	4,068,223
3,920,579	4,040,523	4,059,150	4,068,260
3,920,717	4,041,781	4,059,153	4,068,265
3,922,148	4,042,811	4,059,166	4,068,327
3,928,001	4,043,054	4,059,428	4,068,340
3,932,301	4,043,535	4,059,684	4,068,525
3,933,702	4,044,109	4,059,706	4,068,904
3,935,195	4,044,946	4,060,492	4,069,062
3,935,787	4,045,004	4,060,660	4,069,397
3,952,239	4,045,119	4,060,713	4,070,243
3,954,767	4,045,629	4,060,867	4,070,256
3,958,041	4,045,946	4,061,590	4,070,427
3,971,010	4,046,003	4,061,622	4,070,706
3,976,337	4,046,244	4,061,776	4,071,029
3,977,568	4,046,871	4,061,958	4,072,123
3,978,712	4,046,951	4,062,916	4,072,363
3,984,455	4,047,009	4,063,357	4,072,934
3,998,552	4,047,328	4,063,632	4,073,003
4,006,544	4,047,547	4,064,216	4,073,334
4,008,690	4,048,506	4,064,450	4,073,412
4,010,595	4,048,983	4,065,197	4,073,668
4,011,058	4,049,497	4,065,381	4,074,146
4,012,497	4,050,173	4,065,402	4,074,575
4,015,192	4,050,237	4,065,406	4,074,846
4,017,839	4,050,938	4,065,455	4,075,122
4,019,033	4,051,128	4,065,502	4,075,165
4,020,270	4,051,201	4,065,576	4,075,280
4,021,494	4,051,347	4,065,601	4,075,441
4,023,885	4,051,511	4,065,612	4,075,461
4,024,312	4,051,905	4,065,799	4,075,613
4,024,480	4,052,170	4,065,858	4,075,695
4,025,353	4,052,434	4,065,980	4,075,849
4,026,680	4,053,330	4,066,487	4,076,017
4,026,911	4,053,475	4,066,628	4,076,122
4,026,925	4,053,629	4,066,730	4,076,404
4,027,676	4,054,175	4,066,850	4,076,559
4,027,855	4,054,499	4,067,021	4,076,629
4,028,292	4,054,530	4,067,157	4,076,667
4,030,210	4,055,035	4,067,184	4,076,871
4,030,937	4,055,137	4,067,242	

Disclaimers

3,364,929.—*Walter S. Ide,* Eastchester, and *William H. Nickerson,* Tuckahoe, N.Y. METHOD FOR ADMINISTERING MUSCLE RELAXANT DRUG. Patent dated Jan. 23, 1968. Disclaimer filed Apr. 20, 1978, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to all claims of said patent.

3,565,080.—*Walter S. Ide,* Eastchester, and *William H. Nickerson,* Tuckahoe, N.Y. NEUROMUSCULAR BLOCK MONITORING APPARATUS. Patent dated Feb. 23, 1971. Disclaimer filed Apr. 20, 1978, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to all claims of said patent.

3,612,060.—*John E. Colyer,* Longueville, New South Wales, Australia. PERIPHERAL NERVE STIMULATOR. Patent dated Oct. 12, 1971. Disclaimer filed Apr. 20, 1978, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to all claims of said patent.

3,624,484.—*John E. Colyer,* Longueville, New South Wales, Australia. OSCILLATOR OUTPUT CIRCUIT CONFIGURATION. Patent dated Nov. 30, 1971. Disclaimer filed Apr. 21, 1978, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to all claims of said patent.

3,659,285.—*Ralph H. Baer,* Manchester, *William T. Rusch,* Hollis, and *William L. Harrison,* Nashua, N.H. TELEVISION GAMING APPARATUS AND METHOD. Patent dated Apr. 25, 1972. Disclaimer filed Apr. 17, 1978, by the assignee, *Sanders Associates, Inc.*

Hereby enters this disclaimer to claims 1, 2, 5 and 6 of said patent.

3,682,162.—*John E. Colyer,* Longueville, New South Wales, Australia. COMBINED ELECTRODE AND HYPODERMIC SYRINGE NEEDLE. Patent dated Aug. 8, 1972. Disclaimer filed Apr. 20, 1978, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to all claims of said patent.

Patents Available for Licensing or Sale

D. 240,772. JACKET OR SIMILAR ARTICLE. Jerome Williams, 385 Linoleum Way, Pittsburgh, Pa., 15219.

D. 246,769. TIE CLIP. Raymond F. Kozak, Lehigh Plaza Apts. #G–7 2060, Westgate Drive, Bethlehem, Pa. 18018.

3,376,009. READING STAND. Dorothy Domino, 5283 East Huntington, Fresno, Calif. 93727.

3,680,237. OUT-DOOR ILLUMINATED SIGN. John G. Finnerty, 251 De Grand Ave., Teaneck, N.J. 07666.

3,734,970. IMPROVEMENTS IN OR RELATING TO THE PREPARATION OF METHYL-B-PHENYL-ETHYLETHER (OIL OF PADANUS-ODORATISSIMUS). Dr. J. C. Chaternedi, Manik Miwas, Lala-Ka-Bazar, Lashkar (lyWalior), Madhya Pradesh, India.

3,785,538. FINGER-ACTUATED SNAP OPEN CAPS FOR BOTTLES, COLLAPSIBLE TUBES AND THE LIKE. Anthony J. Cocozella, 26 Wyman Rd., Braintree, Mass., 02184.

3,884,465. WEIGHT FOR BOWLERS. Leon Milsner, 90 Island Ct., Walnut Creek, Calif. 94595.

3,893,724. GATE LOCKING DEVICE. Frederick A. Reinfield, Box 223, Parkston, S. Dak. 57366.

3,953,983. REFRIGERATION METHOD AND REFRIGERATION APPARATUS FOR CARRYING OUT THE METHOD. Ernst Sander. Correspondence to: Craig & Antonelli, 909 Watergate Office Bldg. 2600 Virginia Ave. NW., Washington, D.C., 20037.

3,981,452. IRRIGATION PIPES WITH DRIPPER UNITS AND METHOD OF ITS MANUFACTURE. Gershon Eckstein. Correspondence to: Perry Carvellas, Esq. 413 N. Washington St., Alexander, Va., 22314.

4,004,820. TRANSPORT CART. Kurt Weber. Correspondence to: Rieter Machine Works, Ltd. CH–8406 Winterthur, Switzerland.

4,031,917. CONSTANT FLOW GAS REGULATOR. Charles De John, 35 Beverly Rd., West Caldwell, N.J.

4,040,817. METHOD FOR THE REDUCTION OF IRON ORES IN A SHAFT FURNACE, ESPECIALLY IN A BLAST FURNACE WITH OIL INJECTION. Correspondence to: Holman & Stern, 2401 15th St. NW., Washington, D.C., 20009.

4,044,476. EDUCATIONAL METHODS AND DEVICES. Jeanette B. Marsh, 1400 North Lake Shore Drive, 14–M, Chicago, Ill., 60610.

4,054,234. COMBINATION GARMENT HANGER. John Thomas, 2105 Tomlinson Ave., Bronx, N.Y. 10461.

4,056,471. ADSORPTION ARRANGEMENT. Chemische Fabrik Uetikon, Switzerland. Correspondence to Michael J. Striker, 360 Lexington Ave., New York, N.Y., 10017.

4,064,835. AIR CONDITIONED PET BED. Ludwig Rabenbauer, 1495 Granville Ave., Pontiac, Mich., 48055.

4,064,880. SANITARY TUBULAR NAPKIN FOR MALES. Dexter J. Logan, P.O. Box 1012, West Covina, Calif., 91793.

4,066,087. PEA SHELLING DEVICE. Roisa J. Rodgers, Centerville, Ga. Correspondence to: Frederick L. Bergert, Crystal Square No. 5, 1755 Jefferson Davis Hwy., Arlington, Va., 22202.

4,067,451. ROLL FLIP MACHINE. William L. Winters, 2516 32nd Ave., N. Birmingham, Ala.

4,075,845. FREEZE/THAW POWER SYSTEM. Milton Frank Allen, 2989 McCully Drive NE, Atlanta, Ga., 30345.

4,076,201. ADJUSTABLE CHAIR SPINDLE ASSEMBLY. Walter E. Hudnall, 2157 W. 236th Place, Torrance, Calif., 90501.

4,079,987. CONTAINER SYSTEM FOR ENTERTAINMENT AND COMMUNICATIONS EQUIPMENT. Daniel T. Bumgardener, 4740 Appian Way #50, El Sobrante, Calif., 94803.

4,082,333. COMBINATION OF INTERLOCKING SECURITY ON CHAIN DOOR GUARDS. Bernard C. Segal, 150–6J Dreiser Loop, Bronx, N.Y. 10475.

4,082,947. SOLAR COLLECTOR AND DRIVE CIRCUITRY CONTROL MEANS. George L. Haywood, Box 2602, Evergreen, Colo., 80439.

The following patents are offered by Philip C. Peterson. Inquiries should be directed to Peterson Boats, Inc., P.O. Box 7405, Chicago, Ill, 60680.

D. 241,978. BOAT.

3,989,002. MOTOR POWERED WATERCRAFT FOR RIDING IN STANDING POSITION.

The following two patents are offered by John O. Richards, 980 Mill Circle, Apt. #99, Alliance, Ohio, 44601.

3,578,840. REVOLVING REFLECTOR.

3,835,507. ROPE HOLDING DEVICE.

The General Electric Company is prepared to grant nonexclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for licenses may be addressed to the General Electric Company, Appliance Components Business Division, 1635 Broadway, Fort Wayne, Ind., 46804.

3,740,599. DYNAMOELECTRIC MACHINE ASSEMBLY.

3,743,872. DYNAMOELECTRIC MACHINES AND ASSEMBLY OF SAME WITH A CONTROL DEVICE.

3,848,837. MOUNTING ADAPTER MEANS FOR DYNAMOELECTRIC MACHINE.

4,032,807. INSIDE-OUT INDUCTOR MOTOR/ALTERNATOR WITH HIGH INERTIA SMOOTH ROTOR.

4,063,060. METHODS OF MAKING TORSIONAL VIBRATION ISOLATING MOTOR MOUNTING SYSTEMS AND ARRANGEMENTS.

Applications for license under the following patent should be addressed to. Patent Counsel, Drive System Department, General Electric Company, 1501 Roanoke Blvd., Salem, Va., 24153.

3,962,685. DATA PROCESSING SYSTEM HAVING PYRAMIDAL HIERARCHY CONTROL FLOW.

Applications for license may be addressed to Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Avenue, Philadelphia, Pa., 19142.

3,663,906. ELECTRICAL CIRCUIT BREAKER WITH MAGNETICALLY ASSISTED CLOSING MEANS.

3,812,404. INCREASING THE INITIAL FLOW RATE IN A RECTIFIER ASSEMBLY EMPLOYING ELECTROMAGNETICALLY-PUMPED LIQUID METAL FOR COOLING.

4,025,886. ELECTRICAL CIRCUIT BREAKER WITH ELECTRO - MAGNETICALLY - ASSISTED CLOSING MEANS.

Application for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,320,777. AUTOMATIC WASHING MACHINE INCLUDING DISPENSING MEANS.

3,727,434. ADDITIVE DISPENSING SYSTEM.

3,736,767. AUTOMATIC ICEMAKER INCLUDING REVERSIBLE MOLD CAVITIES.

3,760,612. ADDITIVE DISPENSING SYSTEM.

3,767,334. HERMETICALLY SEALED COMPRESSOR ASSEMBLY.

3,785,566. SEALING SYSTEM FOR WASHING MACHINE.

3,794,443. WIDE DISPERSON FAN IMPELLER.

3,908,392. DUAL CONTROL COORDINATING APPARATUS FOR A REFRIGERATOR.

3,908,394. WATER-DISPENSING SYSTEM.

3,926,001. HOVABLE DECK FOR A TOP-OPENING FREEZER.

4,062,205. REUSABLE WATER SOFTENER SYSTEM FOR CLOTHES WASHER.

4,066,393. REUSABLE WATER SOFTENER SYSTEM FOR CLOTHES WASHER.

4,068,815. SELF LOCKING SUPPORT MECHANISM.

4,069,596. AIR SEAL ARRANGEMENT IN A CLOTHES DRYER.

Application for license may be addressed to General Electric Company, 100 Woodlawn Avenue, Pittsfield, Mass., 02101.

3,195,082. ELECTRICAL REACTOR.

3,242,879. RAILROAD TRANSPORTATION OF LARGE TRANSFORMERS.

3,349,357. TRANSFORMER CORE REINFORCING PLATE.

3,387,208. IMPEDANCE COMPENSATED HIGH PRECISION ELECTRICAL CAPACITANCE MEASURING BRIDGE.

3,441,885. HV CURRENT TRANSFORMER HAVING RIGID SECONDARY EYE BOLT AND FLEXIBLE PRIMARY CABLES IN HV TANK.

3,528,046. INTERLACED DISK WINDING WITH IMPROVED IMPULSE VOLTAGE GRADIENT.

3,544,847. FLIP-FLOP LIGHTNING ARRESTER WITH REDUCED PROTECTIVE LEVEL.

3,559,457. HYDROGEN DETECTOR.

3,579,165. WINDING CONNCETION FOR SINGLE PHASE TWO LEG ELECTRIC TRANSFORMER.

3,619,708. SURGE VOLTAGE ARRESTER ASSEMBLY HAVING INTEGRAL CAPACITOR MOUNTING AND CONNECTING MEANS.

3,714,318. METHOD OF MAKING A SEALING GASKET.

3,819,301. SINGLE VALVE VAPOR PUSH PUMP.

3,820,466. MAGNETIZED CRANE RAIL TROUGH—ANTICONTAMINANT TROUGH.

3,834,835. DOUBLE VALVE VAPOR PUSH PUMP.

3,859,568. OVERVOLTAGE SURGE ARRESTER WITH IMPROVED VOLTAGE GRADING CIRCUIT.

3,859,569. OVERVOLTAGE SURGE ARRESTER WITH IMPROVED VOLTAGE GRADING CIRCUIT.

3,913,056. VARISTORS WITH PATTERNED ELECTRODES.

4,003,653. METHOD OF PRODUCING COLOR SLIDES FROM BLACK AND WHITE ORIGINALS.

The RCA Corporation offers to grant nonexclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to RCA Corporation, staff vice president, Domestic licensing, 30 Rockefeller Plaza, New York, N.Y., 10036.

4,078,095. SLURRY PROCESS FOR COATING PARTICLES UPON THE VIEWING-WINDOW SURFACE OF A CATHODE-RAY TUBE.

4,078,206. DIFFERENTIAL AMPLIFIER.

4,078,207. PUSH-PULL TRANSISTOR AMPLIFIER WITH DRIVER CIRCUITRY PROVIDING OVERCURRENT PROTECTION.

4,078,212. DUAL MODE FREQUENCY SYNTHESIZER FOR A TELEVISION TUNING APPARATUS.

4,078,247. INVERTER CIRCUIT CONTROL CIRCUIT FOR PRECLUDING SIMULTANEOUS CONDUCTION OF THYRISTORS.

4,079,282. PHOTOTUBE HAVING APERTURED ELECTRODE RECESSED IN CUP-SHAPED ELECTRODE.

4,079,286. GRID HAVING REDUCED SECONDARY EMISSION CHARACTERISTICS AND ELECTRON DISCHARGE DEVICE INCLUDING SAME.

4,079,293. SWITCHED MODE VERTICAL AMPLIFIER WITH ELIMINATION OF FEEDBACK RINGING.

4,079,295. POWER SUPPLY ARRANGEMENT WITH MINIMUM INTERACTION BETWEEN PLURAL LOADS.

4,079,325. MICROWAVE FREQUENCY DISCRIMINATOR.

4,079,411. DIFFRACTIVE PHASE FILTER HAVING NEAR FIELD WAVELENGTH DEPENDENT FOCUSING PROPERTIES.

4,079,424. AUTOMATIC TRANSIENT BEAM CURRENT LIMITER.

4,079,455. MICROPROCESSOR ARCHITECTURE.

4,079,456. OUTPUT BUFFER SYNCHRONIZING CIRCUIT HAVING SELECTIVITY VARIABLE DELAY MEANS.

4,079,522. APPARATUS AND METHOD FOR CLEANING AND DRYING SEMICONDUCTORS.

4,080,539. LEVEL SHIFT CIRCUIT.

4,080,571. APPARATUS FOR MEASURING THE CURRENT-VOLTAGE CHARACTERISTICS OF A TRAPATT DIODE.

4,080,625. PICKUP CIRCUITRY FOR A VIDEO DISC PLAYER WITH PRINTED CIRCUIT BOARD.

4,080,626. DISCONTINUOUS MOTION SPECIAL EFFECTS GENERATOR FOR TELEVISION.

4,080,630. LINE SCAN CONVERTER FOR AN IMAGE DISPLAY DEVICE.

4,080,641. GROUND FAULT DETECTOR.

4,080,722. METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES HAVING A COPPER HEAT CAPACITOR AND/OR COPPER HEAT SINK.

4,080,763. SKYLIGHT FRAME CONSTRUCTION.

4,081,721. CONDUCTION OVERLAP CONTROL CIRCUIT FOR SWITCHED OUTPUT STAGES.

4,081,722. SIGNAL PROCESSOR FOR SWITCHED VERTICAL DEFLECTION SYSTEM.

4,081,758. LOW DISTORTION SIGNAL AMPLIFIER ARRANGEMENT.

Disclaimer and Dedication

4,002,911.—*Godfrey Newbold Hounsfield*, Newark, England. DATA ACQUISITION IN TOMOGRAPHY. Patent dated Jan. 11, 1977. Disclaimer filed Apr. 28, 1978, by the assignee, *EMI Limited*.

Hereby disclaims and dedicates to the Public the entire remaining term of all claims of said patent.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available form the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the Patent Application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Services Division, Federal Bldg., Agricultural Research Service, Hyattsville, Md. 20782

Patent application 853,717. Precooked Potato Products. Filed Nov. 21, 1977.

Patent 4,055,675. Preparation of Puffed Fruit. Filed Dec. 13, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,061,094. Magnetic Seed Delivery Autodibble Planter. Filed Aug. 19, 1976. Patented Dec. 6, 1977. Not available NTIS.

Patent 4,072,669. Preparation of Protein Isolates from Safflower Seeds. Filed Mar. 7, 1977. Patented Feb. 7, 1978. Not available NTIS.

U.S. DEPARTMENT OF COMMERCE

National Technical Information Service
5285 Port Royal Road, Springfield, Va. 22161

Patent application 851,326. Frequency Stabilization Utilizing Multiple Modulation. Filed Nov. 14, 1977.

Patent application 870,384. Frequency Stabilizing System and Method for Beam Type Device. Filed Jan. 18, 1978.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE

National Institutes of Health, Chief, Patents Branch, Westwood Building, Bethesda, Md. 20014

Patent application 823,186. Random Phase Diffuser for Reflective Imaging. Filed Aug. 9, 1977.

Patent application 840,783. Facile Synthesis of 3'-Phosphadenosie 5'-Phosphosulfate (PAPS). Filed Oct. 11, 1977.

Patent 4,030,141. Multi-Function Control System for an Artificial Upper-Extremity Prosthesis for Above-Elbow Amputees. Filed Feb. 9, 1976. Patented June 21, 1977. Not available NTIS.

Patent 4,064,023. Electrochemical Growth of Calcium Hydroxide Crystals from Electrolyte Solutions. Filed Aug. 9, 1976. Patented Dec. 20, 1977. Not available NTIS.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 6, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-3-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-20-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-1-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-25-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-2-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-2-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-30-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-21-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-24-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-7-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-26-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	3-7-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GRAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-21-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-13-77

Expiration of patents: The patents within the range of numbers indicated below expire during May 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,981,954 to 2,986,736, inclusive
Plant Patents..... Numbers 2,055 to 2,066, inclusive

REISSUES

JUNE 13, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,664
HYDRAULIC PULLEY APPARATUS

Charles Joseph Kuhn, Lujunga, Calif., assignor to Kansas Jack, Inc., McPherson, Kans.

Original No. 3,589,680, dated Jun. 29, 1971, Ser. No. 738,450, Jun. 20, 1968. Application for reissue Sep. 5, 1972, Ser. No. 286,182

Int. Cl.[2] B21D *1/14*

U.S. Cl. 72—444 **8 Claims**

1. A pulley apparatus adapted to rest on a floor comprising:
a frame having a base and an upper vertical stanchion;
attachment means located on said base;
a horizontally oriented hydraulic cylinder connected to said base above said attachment means and having a piston rod axially movable therein and extending out of one end of the cylinder for substantially horizontal reciprocation;
a first pulley rotatably mounted on the end of said piston rod for substantially horizontal reciprocation therewith;
a second pulley rotatably mounted on said frame above said hydraulic cylinder, said first pulley adapted to travel in a direction away from said attachment means and said second pulley;
means connected to said frame adjacent said second pulley adapted for anchoring said frame relative to said floor;
flexible chain means removably connected at one end to said attachment means, said flexible chain means further extending around said first pulley in one direction and around said second pulley in the opposite direction, with the other end adapted to be attached to a workpiece; and
selectively operable lock means mounted on said frame adjacent said second pulley for preventing travel of said chain in a direction toward said workpiece whereby, upon extension of the piston rod, the displacement of the first pulley draws the flexible chain means over the two pulleys causing the end of the flexible chain means attached to the workpiece to be displaced toward the second pulley in a direction opposite that of the first pulley.

Re. 29,665
APPARATUS FOR EJECTING A MIXTURE OF A PLURALITY OF LIQUIDS

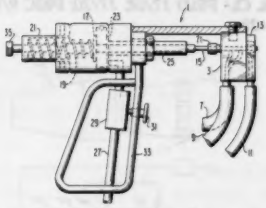
Frederick E. Gusmer, Mantoloking; Carl W. Sundberg, Jr., Chatham, both of N.J., and Joseph E. Hayes, Jr., Woodland Park, Colo., assignors to Gusmer Corporation, Old Bridge, N.J.

Original No. 3,876,145, dated Apr. 8, 1975, Ser. No. 435,685, Jan. 23, 1974. Application for reissue Feb. 24, 1977, Ser. No. 771,810

Int. Cl.[2] B05B *15/02*

U.S. Cl. 239—112 **18 Claims**

1. Apparatus for ejecting a mixture of a plurality of liquids, comprising a mixing chamber having an outlet opening and a plurality of spaced inlets which are spaced different distances from said outlet opening, means for separately introducing different liquids into the chamber through said inlets, a plunger reciprocable in the chamber between forward and rear positions, the differently spaced inlets communicating with the chamber and with each other in said rear position of the plunger, and means sealing against the plunger in the forward position of the plunger to seal said inlets from each other, the forward end of the plunger being forward of all said inlets in said forward position of the plunger and being rearward of all said inlets in said rear position of the plunger, *the surface of one of said plunger and sealing means being an elastic deformable material, said sealing means comprising an annular throat in*



which said plunger reciprocates with an interference fit, said plunger being in sealing contact with said throat in said forward position and exposing all said inlets to each other in said rear position, said forward end of said plunger being disposed on opposite sides of said throat in said forward and rear positions, said inlets being disposed on opposite sides of said throat.

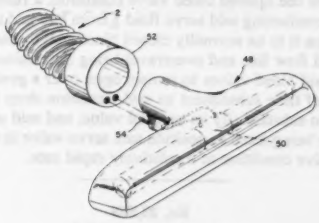
Re. 29,666
ELECTRICAL CONTACT TERMINAL HAVING IMPROVED WIRE-RECEIVING SLOT

Charles Edward Reynolds, Mechanicsburg, and John Clinton Swartz, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Original No. 3,972,578, dated Aug. 3, 1976, Ser. No. 569,421, Apr. 18, 1975. Application for reissue Feb. 25, 1977, Ser. No. 772,207

Int. Cl.[2] H01R *3/04*

U.S. Cl. 339—15 **4 Claims**



11. In an electrical contact terminal of the type intended for application to one end of a coil spring conductor, said terminal being of the type comprising a conductor-receiving portion and a contact portion, said conductor-receiving portion being generally U-shaped in cross-section and comprising a web and sidewalls, said contact portion extending from said web at one end thereof, said sidewalls having parallel free edges which are remote from said web, each of said sidewalls having a wire-receiving slot means extending therein from its free edge towards said web, the improvement to said terminal comprising:

a reverse fold in each of said sidewalls extending parallel to the axis of said conductor-receiving portion whereby each of said sidewalls comprises a pair of parallel plate-sections connected by one of said folds, said fold in each sidewall constituting said free edge thereof, said slot means in each sidewall comprising a slot in each of said plate-sections, whereby,

upon insertion of an end portion of said coil spring into said slot means, edge portions of said slot means will engage, and establish electrical contact with said wire, and said contact portion will extend from said contact portion parallel to the axis thereof.

Re. 29,667

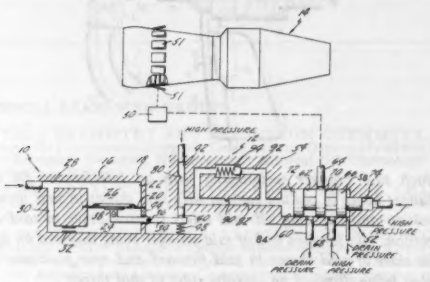
COMPRESSOR SURGE SENSOR

Kermit I. Harner, Windsor, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Original No. 3,809,490, dated May 7, 1974, Ser. No. 356,648, May 2, 1973. Application for reissue Apr. 26, 1976, Ser. No. 680,623

Int. Cl.² F01D *17/08, 17/20;* F02C *9/02*

U.S. Cl. 415—28 **9 Claims**



1. A surge control system for opening a bleed valve of the compressor section of a turbine type power plant so as to prevent or eliminate surge therein comprising means for sensing the pressure at the compressor for producing a signal whenever a predetermined transitory drop in said pressure occurs, an actuator connected to said bleed valve for opening and closing said bleed valve, control means including a servo valve and servo fluid responsive to said signal for controlling said actuator to position it to an open position, a relatively unrestricted flow line for leading said servo fluid [to] *from* said servo valve to position it from a normally closed bleed valve condition to an opened bleed valve condition, said servo valve movable to overtravel null condition when said servo valve is in the opened bleed valve condition, a restricted flow line for conducting said servo fluid [from] *to* said servo valve to position it to its normally closed bleed valve condition, said restricted flow line and overtravel being dimensioned so as to permit said bleed valves to remain open over a predetermined amount of time subsequent to said transition drop in pressure returns to substantially its original value, and said unrestricted flow line being sized to position said servo valve in the opened bleed valve condition at a relatively rapid rate.

Re. 29,668

GLYCINEAMIDES

Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Original No. 3,853,862, dated Dec. 10, 1974, Ser. No. 353,607, Apr. 23, 1973. Division of Ser. No. 746,186, Nov. 30, 1976. Application for reissue Mar. 23, 1977, Ser. No. 780,312

Int. Cl.² C07D *277/44, 213/75, 273/00*

U.S. Cl. 260—306.8 R **2 Claims**

9. A compound of the formula

$$R_2—NH—CH_2—CO—NH—R_1$$

and the dihydrobromide salts thereof wherein R_1 is selected from the group consisting of phenyl; monosubstituted phenyl wherein said substituent is selected from the group consisting of fluoro, chloro, methyl and methoxy; 2-thiazolyl; 4,5-dimethyl-2-thiazolyl; 2-pyridyl; 6-methyl-2-pyridyl, and 5-methyl-3-isoxazolyl and R_2 is alkyl having from 1 to 3 carbon atoms.

Re. 29,669

PRODUCTION OF 4-HYDROXY-1,2-BENZOTHIAZINE-3-CARBOXAMIDES

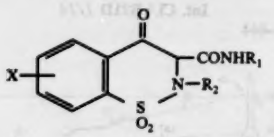
Joseph G. Lombardino, Niantic, Conn., assignor to Pfizer, Inc., New York, N.Y.

Original No. 3,853,862, dated Dec. 10, 1974, Ser. No. 353,607, Apr. 23, 1973. Application for reissue Nov. 30, 1976, Ser. No. 746,186

Int. Cl.² C07D *279/02*

U.S. Cl. 544—49 **8 Claims**

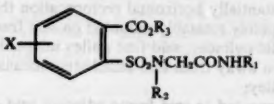
1. A process for the preparation of a compound of the formula:



wherein R_1 is selected from the group consisting of phenyl; monosubstituted phenyl wherein said substituent is selected from the group consisting of fluoro, chloro, methyl and methoxy; 2-thiazolyl; 4,5-dimethyl-2-thiazolyl; 2-pyridyl; 6-methyl-2-pyridyl, and 5-methyl-3-isoxazolyl;

R_2 is alkyl containing from 1 to 3 carbon atoms; and

X is a substituent selected from the group consisting of hydrogen, methyl, methoxy, fluoro, chloro and bromo, which comprises contacting a compound of the formula:



wherein R_3 is alkyl containing from 1 to 3 carbon atoms, with a metal hydride selected from the group consisting of alkali and alkaline earth metal hydrides, in a reaction-inert solvent at 50°–150° C.

Re. 29,670

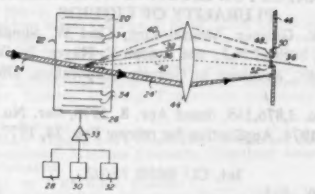
MULTI-COLOR ACOUSTOOPTIC MODULATOR

Richard A. Spaulding, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,783,185, dated Jan. 1, 1974, Ser. No. 221,668, Jan. 28, 1972. Application for reissue Dec. 17, 1975, Ser. No. 641,470

Int. Cl.² H04N *5/84, 9/12*

U.S. Cl. 358—4 **29 Claims**



1. An apparatus [including an acoustooptic cell] for [modulating and] diffracting *source* light of different wavelengths [impinging on said cell] into a composite, collinear output beam of light comprising a selected number of the different wavelengths present in said [impinging] *source* light, the [combination] *apparatus* comprising:

an acoustooptic cell [having] *locatable in the path of such source light;*

electrical-to-acoustical transducer means operatively attached [thereto] *to said cell;*

[means for impinging multi-wavelength light upon said cell;]

means for generating a [plurality] *number* of electrical signals [in accordance with a] *corresponding to the* selected number of *wavelengths in the* collinear output [beams] *beam,* each signal being of a *predetermined* different fixed frequency *selected to cause diffraction of at least a portion of light of each of the selected wavelengths along a common output axis;* and

means for applying said electrical signals to said transducer means to form acoustic waves in said cell which diffract said *source* light [impinging on said cell] to form said composite, collinear output beam of light of said selected number of different wavelengths.

PLANT PATENTS

GRANTED JUNE 13, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,262
IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens Inc., Ashtabula, Ohio

Filed Apr. 12, 1977, Ser. No. 786,849
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of impatiens plant known by the cultivar name Freedom and particularly characterized as to uniqueness by the combined characteristics of low, compact, self-branching characteristics; soft pink flower color, green foliage with distinctive, variegated zones of yellow color; separated top and lower flower petals, with the color in the throat being of a deeper tone than the petals; excellent outdoor growth characteristics, and excellent keeping qualities as a potted plant.

4,263
PEAR TREE

Charles Lyle Kinney, 1356 Siskiyou, Medford, Oreg. 97501

Filed Jul. 19, 1977, Ser. No. 817,101
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—36 1 Claim

1. A new and distinct variety of pear tree, substantially as shown and described herein, distinguished principally from its parent, the Regal Red Comice, by being a spur-type tree bearing fruit, having a substantially solid red color throughout the growing season, with little or no purplish tint and having very slight yellowish undercoat when ripe, having substantially thicker and tougher skin, and having a rounded shape more nearly similar to the standard Doyenne Du Comice.

4,264
ROSE PLANT

Ernest Schwartz, Kingsville, Md., assignor to F. Harmon Saville, Rowley, Mass.

Filed Aug. 4, 1977, Ser. No. 821,818
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by high centered, recurrent flowers of attractive coloring borne primarily singly on long stems and having a spiral, circular outline with outer petals which lighten and inner petals which deepen in color on aging so as to produce a two-tone effect and a light lavender pink tonality and a vigorous, upright growing plant.

4,265
ROSE PLANT

Ernest Schwartz, Kingsville, Md., assignor to F. Harmon Saville, Rowley, Mass.

Filed Aug. 4, 1977, Ser. No. 821,783
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—8 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by high centered, recurrent flowers of light yellow coloring which are long lasting on the plant until dropping and grown on a vigorous plant with abundant foliage and virtually no thorns which can grow well in reduced light.

PLANT PATENTS

GRANTED JUNE 15, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce them in black and white.

4,261
CHRYSANTHEMUM PLANT
James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsen Inc., Ashtabula, Ohio
Filed Apr. 12, 1971, Ser. No. 750,869
Int. Cl.² A01H 1/00
U.S. Cl. PP.—62 1 Claim

1. A new and distinct cultivar of topiarying plant known by the cultivar name Floyd as and particularly characterized as to uniqueness by the combined characteristics of low, compact, well-branching characteristics with pink flower color, green foliage with distinctive, variegated zones of yellow color appearing top and lower flower petals, with the color in the tubular calyx of a deeper tone than the petals, excellent vaseline growth characteristics, and excellent keeping qualities as a potted plant.

4,262
PEAR TREE
Charles Lyle Kinney, 1150 Bledsoe, Medford, Oreg. 97501
Filed Jul. 12, 1971, Ser. No. 161,101
Int. Cl.² A01H 1/00
U.S. Cl. PP.—58 1 Claim

1. A new and distinct variety of pear tree, substantially as shown and described herein, distinguished principally from its parent, the Royal Red Comice, by being a spur-type tree bearing fruit having a substantially solid red color throughout the growing season, with little or no purplish tint and having very slight yellowish undercolor when ripe, having substantially thicker and rougher skin, and having a somewhat shape more nearly similar to the standard D'anjou Pear Comice.

4,263
ROSE PLANT
Ernest Schwartz, Ridgefield, Md., assignor to T. Hartman Ziegler, Poolesville, Md.
Filed Aug. 4, 1971, Ser. No. 169,318
Int. Cl.² A01H 1/00
U.S. Cl. PP.—9 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as shown and described, characterized particularly by high resistance to powdery mildew, attractive coloring when grown in long days and having a spiral circular outline with outer petals flowing and curving outwardly, and a light lavender pink middle and a slight rose tinge.

PATENTS

GRANTED JUNE 13, 1978

ERRATA

For CLASS	See PATENT NO.
128–294	4,094,020
042–090	4,094,098
072–238	4,094,174
400–161.4	4,094,397
431–202	4,094,632
544–026	4,094,872
544–243	4,094,873
544–258	4,094,874
568–802	4,094,912
568–778	4,094,913
568–862	4,094,914
542–422	4,095,023
526–001	4,095,031
526–011.1	4,095,032
526–090	4,095,033
235–462	4,095,091
235–304.1	4,095,094
235–419	4,095,095
235–463	4,095,096
340–147 MD	4,095,239
358–288	4,095,248

PATENTS

GRANTED JUNE 13, 1978

ERRATA

Re CLASS	Re PATENT NO.
128–294	4,094,320
042–080	4,094,099
072–238	4,094,154
400–161.4	4,094,307
431–082	4,094,632
544–059	4,094,872
544–243	4,094,872
544–259	4,094,874
705–802	4,094,913
705–717	4,094,913
705–803	4,094,914
705–472	4,095,023
328–001	4,095,031
328–011.1	4,095,032
328–080	4,095,032
275–462	4,095,091
235–304.1	4,095,096
235–419	4,095,097
235–482	4,095,099
340–147 MD	4,095,219
328–298	4,095,340

PATENTS

GRANTED JUNE 13, 1978

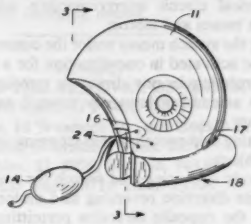
GENERAL AND MECHANICAL

4,094,014
WORKMAN'S GLOVE
Charles W. Schroeder, P.O. Box 125, Star Route, Caliente, Calif. 93518
Filed Oct. 29, 1976, Ser. No. 736,765
Int. Cl.[2] A41D *27/12*
U.S. Cl. 2—161 R **8 Claims**

1. An improved workman's glove, said glove comprising, in combination:
   a. a protective sheath in the shape of a hand with fingers and adapted to cover the hand of a workman, including the fingers thereof;
   b. a first knuckle-protecting pad of extended surface area secured to the outside surface of said sheath and adapted to overlie the knuckles on the back of the hand and be configured with respect thereto;
   c. a plurality of finger knuckle protecting pads of extended surface area secured to the outer surface of said sheath and adapted to overlie the finger knuckles and be configured with respect thereto;
   d. non-slip gripping pads located on and secured to the inside of the thumb and index finger areas of said sheath; and,
   e. a protective palm pad of extended surface area secured to substantially all of the palm area of said sheath, and covering substantially all of the lower part of said palm area.

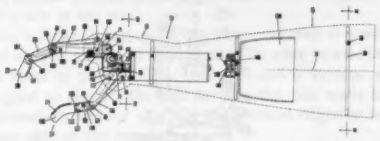
4,094,015
NECK ROLL FOR HELMET
Frank N. Howard, 712 Madison Ct., Apt. 254, Arlington, Tex. 76011
Filed Feb. 7, 1977, Ser. No. 766,392
Int. Cl.[2] A42B *3/02*
U.S. Cl. 2—415 **2 Claims**

1. A neck roll adapted for attachment to a helmet of the type worn by players in contact sports having a face opening and a bottom edge comprising:
   a U-shaped tubular member for encircling the neck of a wearer, said member being formed of a resilient material to serve as a cushion around the neck;
   means at the forward ends of the tubular member projecting upward from said member, said projecting means being provided with fastening means for demountably securing said member to the helmet on each side of the face opening, said projecting means at the forward ends of the tubular member comprising resilient strips adapted to lie against the inner surface of the helmet on each side of the face opening;
   said member being sized and positioned to lie around the bottom edge of the helmet and make firm contact therewith, said tubular member being provided with an upper planar surface engageable in abutting relationship with the bottom edge of the helmet, with the lower surfaces of said tubular member being engageable with portions of the



   users shoulder adjacent to the neck and the back of the user's neck;
   whereby the neck roll will be free to move with the helmet and head and will protect the neck, spine and associated areas from injury.

4,094,016
ARTIFICIAL HAND AND FOREARM
Gary Eroyan, 1314 N. Crawford St., Detroit, Mich. 48209
Filed Dec. 4, 1976, Ser. No. 746,794
Int. Cl.[2] A61F *1/06, 1/00*
U.S. Cl. 3—1.1 **20 Claims**



1. An artificial hand and forearm comprising a hollow elongated formed housing of the general shape of the forearm and hand having a longitudinal axis and open at its rear end adapted to receive the stub end of the human forearm;
   with portions of the housing adapted to receive the corresponding upper arm and adapted for securing thereto;
   the housing at its front end having a series of thumb and finger apertures therein;
   a mounting plate anchored within the hand end of the housing;
   a series of elongated finger assemblies including a forefinger assembly adjacent their one ends nested within the hand end of the housing, and inwardly of said one ends pivotally mounted upon said plate upon a transverse axis;
   the other ends of said finger assemblies projecting axially through said finger apertures;
   a thumb assembly spaced from said finger assemblies, adjacent one end nested within the hand end of said housing, and inwardly of its end pivotally mounted upon said plate upon a transverse axis;
   the other end of the thumb assembly projecting axially through said thumb aperture and opposed to the forefinger assembly;
   a rotatable camshaft at its ends journaled upon said plate on a transverse axis and spaced from said finger and thumb assemblies;
   a series of spaced cams secured upon said shaft respectively

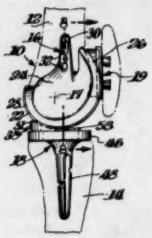
registering with the inner ends of said finger and thumb assemblies;
one cam having a pair of opposed cam surfaces for registry with forefinger and thumb assemblies;
means biasing said finger assemblies into an open position against said cams;
a reversible electric motor within said housing having an axial output shaft;
gear means interconnecting said cam shaft and output shaft;
a power source;
a switch means within said housing; and
an electrical circuit interconnecting said power source, switch means and motor;
whereby the switch means under the control of said arm stub may be activated in one direction for a short period, said cams rotating in one direction moving said finger and thumb assemblies inwardly toward an object gripping position;
deactivating said switch means stopping said fingers to hold said object;
successively activating said switch for a short period in the opposite direction reversing said motor, said cams rotating in the opposite direction permitting said thumb and finger assemblies to move toward a release position, releasing said object, deactivating said switch stopping said fingers in an open position.

4,094,017

KNEE JOINT PROSTHESIS WITH PATELLAR-FEMORAL CONTACT

Larry Stanford Matthews; Herbert Kaufer, and David Ansel Sonstegard, all c/o Howmedica, Inc., 235 E. 42nd St., New York, N.Y. 10017

Filed Feb. 16, 1977, Ser. No. 768,952
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.911 **10 Claims**



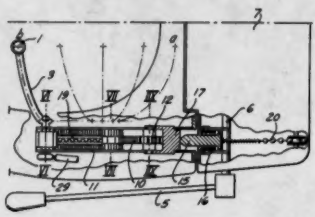
1. A knee joint prosthesis comprising a femoral component, a tibial component, coupling means connecting said femoral and tibial components for movement relative to each other, said coupling means including a pair of spaced substantially spherically curved condyle runners, a femoral attaching means in the top of the femoral component, the tibial component having a base, tibial connecting means on the bottom of the base, the coupling means also including a pair of spheriodally curved spaced parallel concave shoes on the base having upper surfaces intimately mating with the condyle runners for smooth relatively sliding movement between them, a pair of broadly inclined and smoothly merging anterior and superior extensions of the condyle runners on the femoral component, the extensions smoothly merging with each other to form a substantially circular arcuate trough disposed midbetween and parallel to the condyl runners, the trough having a center of curvature slightly posterior and somewhat superior to the center of movement of the femoral component relative to the tibial component, a patellar component, the posterior portion of the patellar component having a concave arcuate ridge for substantially matching the circular trough, the patellar component having a pair of bearing facets on both sides of the ridge which substantially match the lateral sides of the extensions whereby substantially total contact is maintained between the ridge and facets on the patellar component and the trough substantially throughout the entire range of movement of the prosthesis, the femoral and tibial components being made of a biocompatible metal, the bearing facets and ridge of the patellar component being made of a very strong and wear-resistant plastic material, and patellar attaching lugs on the anterior of the patellar component for connecting it to the patella.

4,094,018

BOTTOM DOUCHE FOR FLUSH TOILETS

Johannes Bemthin, Bremerhaven, Germany, assignor to MFB Neuwerk GmbH, Bremerhaven, Germany

Filed Jan. 5, 1976, Ser. No. 646,666
Claims priority, application Germany, Jan. 7, 1975, 2500345
Int. Cl.[2] E03D *9/08*
U.S. Cl. 4—7 **13 Claims**



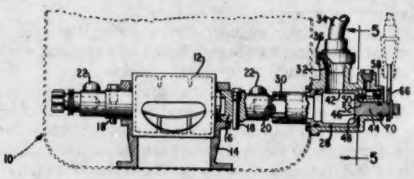
1. A bottom douche for flush toilets comprising opposed arms, one for each side of the toilet, and each arm being supported with one of its ends on the toilet; oppositely disposed, spaced, inwardly and upwardly slanting spray nozzles carried at the free ends of said arms; duct means for passing water through said arms to said nozzles; a handle provided on the toilet, and a linkage connecting said handle and said arms, the said linkage including a rack-and-pinion drive attached to the toilet seat and linking said handle to said arm and nozzles and said rack-and-pinion drive causing the arms to swivel about a horizontal transversal axis by rolling of the said pinion means upon the said rack means, and which linkage further includes a slide surface supporting the pinion means forwardly of said rack means whereby the pinion means after revolving on said rack means exercises a shifting movement in horizontal direction by sliding on said slide surface under the action of said handle.

4,094,019

RETRACTABLE TOILET BOWL ASSEMBLY

Vincent Moore, Fairview, Pa., and Paul N. Levesque, Bristol, Conn., assignors to Altair, Inc., Plymouth, Conn. and American Sterilizer Company, Erie, Pa.

Filed Jul. 29, 1976, Ser. No. 709,941
Int. Cl.[2] E03D *1/00, 3/00, 5/00*
U.S. Cl. 4—312 **7 Claims**



1. In a toilet bowl assembly, a base for rotatably supporting and communicating with an element having a cylindrical surface and for communicating with a sewer gas trap, a toilet

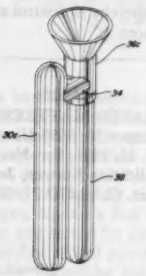
bowl having up and down positions and secured to said element and emptying thereinto, a valve element axially aligned with and fixed to said element, means for delivering water from said valve element to said toilet bowl, said valve element in the down position of the toilet bowl communicable with a flushing valve, and a secondary valve element in an alignable and abutting relationship with and communicating with said valve element and operable to deliver wetting action flow when the toilet bowl is moved from its up position.

4,094,020

URINE SPECIMEN COLLECTOR

Howard Franklin, 3365 Chisholm Tr., Boulder, Colo. 80302

Filed Aug. 26, 1976, Ser. No. 717,580
Int. Cl.[2] E03D *13/00;* **G01N** *1/18, 33/16*
U.S. Cl. 128—294 **17 Claims**



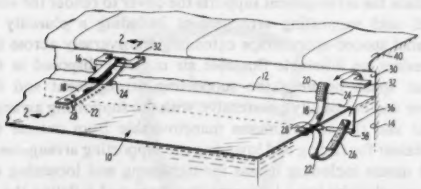
1. A urine specimen collector comprising:
a first tube closed at its lower end and having a mouth at its upper end engageable around the urethral orifice;
a second tube disposed alongside said first tube and open at its lower end;
a duct positioned for passing an overflow of urine from said first tube into said second tube;
and means projecting downwardly within said first tube and having a lower end spaced above the the lower end of said first tube and below said duct for enabling retention of only a subsequent portion of urine flow within said first tube.

4,094,021

SWIMMING POOL COVER

Robert A. Rapp, 5033 Maiden La., Santa Rosa, Calif. 95405

Filed Feb. 3, 1977, Ser. No. 765,419
Int. Cl.[2] E04H *3/16, 3/18*
U.S. Cl. 4—172.12 **1 Claim**



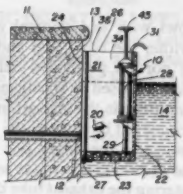
1. A swimming pool cover comprising a flexible pliable plastic sheet having a size and shape to substantially cover the surface of the water within a pool, a plurality of pairs of strap members, each pair having common end portions attached to the sheet and other end portions provided with attachable and disattachable complemental fastening means attachable together to form a closed strap member loop, a clip member for each such loop to secure the same directly to the side wall of the pool below the pool deck, said sheet having means to prevent the movement of air therebeneath when the sheet is in place on the surface of the water in the pool, said means comprising a depending skirt disposed along the periphery of said sheet and adapted to extend downwardly into the pool water while the sheet is supported on the pool water by said strap and clip members, the strap members of each pair being superposed, one above and one below the sheet, rivet means attaching the common ends thereof together, the sheet having a plurality of slots formed therein for the threading therethrough of the strap members below the sheet and subsequent connection of the same to said clip members and attachment together of said complemental fastening means.

4,094,022

APPARATUS FOR THE REMOVAL OF WATER FROM A SWIMMING POOL DUCT

Dominic R. Protano, 10 Woodside Dr., and Ronald L. Conte, 63 Keith Hill Rd., both of Grafton, Mass. 01519

Filed Nov. 22, 1976, Ser. No. 743,685
Int. Cl.[2] E04H *3/16;* **E03B** *11/00*
U.S. Cl. 4—172.17 **6 Claims**



1. Apparatus for use with a swimming pool having an opening on a vertical surface, comprising:
(a) a rear wall adapted to lie in a spaced relationship to the said surface with an upper edge located above the level of the water in the pool,
(b) two side walls extending from the rear wall toward the said surface, each wall having an upper edge located about the level of the water in the pool and a vertical edge adapted to contact the said surface, the side walls being substantially spaced to allow the vertical edges to lie on either side of the opening,
(c) a bottom wall connecting the rear and side walls and having a horizontal edge adapted to engage the said surface beneath the opening,
(d) a pump mounted on the interior of the walls, the pump extending above the upper edges of the walls, and
(e) a continuous sealing strip of elastomer material extending along the vertical edges of the side walls and the horizontal edge of the bottom wall, the rear wall having a vertical plane inner surface located in spaced, parallel relationship with the said pool surface, the side walls having vertical plane inner surfaces that are located in spaced, parallel relationship to each other, each side wall inner surface extending at a right angle to the inner surface of the rear wall to form a corner, the pump being mounted in one of the said corners to form a rigid structure therewith.

4,094,023

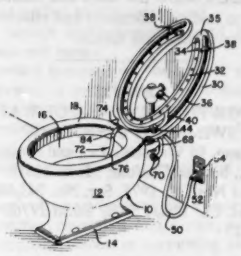
VENTILATED TOILET SEAT

Donald L. Smith, P.O. Box 206, Salem, Ill. 62881

Filed Dec. 11, 1975, Ser. No. 639,772
Int. Cl.[2] E03D *9/04;* **A47K** *13/00*
U.S. Cl. 4—213 **7 Claims**

1. For use with a toilet having a bowl provided with a base formed internally with a discharge passage to be connected to a piping for communication with a sewer line and provided with a trap above said passage and with an upper rim portion on which a seat that is hinged to the bowl is adapted to rest with a normal pool of water being in the bowl above the trap

so as to provide a water seal to prevent any gases from entering into the bowl from the sewer line; a ventilating arrangement for removing odors from the bowl comprising a suction line communicated with the interior of the bowl when the seat is rested on the rim portion, a power driven suction blower unit mounted adjacent the bowl and having an inlet end connected to the suction line and having an outlet and an exhaust tube connected to said outlet and having a portion positioned verti-



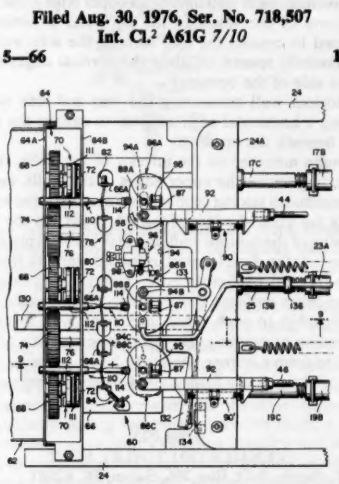
cally within the bowl with said vertical portion having an elbow positioned within the bowl trap and provided with a free terminal outlet portion positioned behind the trap and having opening means disposed in arrangement with the pool of water so as to form a trap in the exhaust tube whereby odors from the bowl are conveyed directly to the discharge passage of the bowl for passage to the sewer line while the normal water pool in the bowl provides a water seal to prevent any sewer gases from entering the exhaust tube through the elbow.

4,094,024

SYSTEM FOR CONTROLLING RELATIVE MOVEMENT OF PORTIONS OF A BED

Roland A. Benoit, Danielson, and Edmund Guillot, Putnam, both of Conn., assignors to InterRoyal Corporation, New York, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,507
Int. Cl.[2] A61G 7/10
U.S. Cl. 5—66 **11 Claims**



1. System for controlling selective relative positional movement of portions of a bed structure with respect to a main supporting bed base frame which comprises:

a plurality of independently operable individual motion transmission means connectable to such portions of the bed structure for correspondingly effecting the selective relative positional movement thereof with respect to the main supporting bed base frame,

common drive transmission means for driving the motion transmission means,

coupling means actuatable for operatively coupling and uncoupling the individual motion transmission means with the common drive transmission means, and

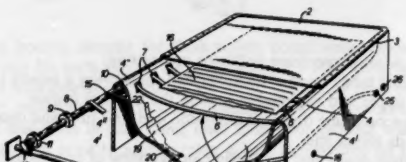
common uniselective control means operatively connected to the coupling means for uniselectively actuating the coupling means for coupling the common drive transmission means with a selective individual motion transmission means and for simultaneously preventing the coupling of the common drive transmission means with the remaining corresponding motion transmission means, said common uniselective control means including a common flexible linear tension means operatively interconnected with the coupling means for limited range actuating displacement for controlling the coupling of such common drive transmission means with only one such motion transmission means at a time, whereby to control such selective relative positional movement.

4,094,025

WATER MATTRESS

Jan Nystad, Amundsvingen 16, 5095 Ulset, Norway

Filed Jul. 12, 1976, Ser. No. 704,556
Claims priority, application Norway, Jul. 30, 1975, 752682
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—365 **2 Claims**



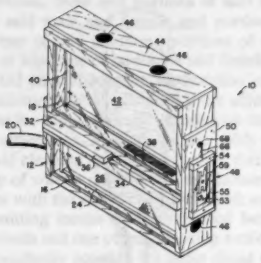
1. In a water mattress assembly, a container having a bottom and upright side walls and an open top and a length and breadth to receive a patient, an elastic, flexible water-tight cover sealed to the side walls and closing the open top of the container to form a water space, a water inlet and a water outlet connected with the water space, a supporting arrangement mounted in the water space for vertical movement toward and away from the cover, the supporting arrangement being essentially coextensive with the cover so that in a raised position the arrangement supports the cover to render the same hard, said supporting arrangement including a plurality of parallel spaced-apart straps extending transversely across the container an inflatable floatable air mattress disposed in the water space between the supporting arrangement and the cover and essentially coextensive with the supporting arrangement and the cover, means maneuverable from outside the container for raising and lowering the supporting arrangement, said means including means for tightening and loosening the straps, whereby upon loosening the straps and inflating the air mattress the latter floats up into engagement with the cover and upon tightening the straps and deflating the air mattress the latter lies on the straps and evens out the spaces between the latter, and means controllable from outside the container for adjusting the degree of inflation of the air mattress, whereby the hardness of the cover may be adjusted between wide limits by varying the vertical position of the supporting arrangement and by varying the degree of inflation of the air mattress.

4,094,026

BEEHIVE

Donald J. Simoni, 177 Pixley St., San Francisco, Calif. 94123

Filed Oct. 13, 1976, Ser. No. 731,964
Int. Cl.[2] A01K 47/00, 47/06
U.S. Cl. 6—1 2 Claims



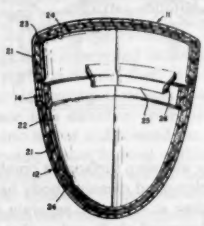
1. An observation beehive comprising a first chamber for enclosing brood nest; a second chamber for enclosing removable honey frame; first and second passageways between said first and second chambers, said first passageway including means for excluding a queen bee and a first gate for blocking and unblocking said first passageway, said second passageway including a second gate having a first closed position and a second open position, and means for permitting one-way passage of bees from said first closed position and a second open position, and means for permitting one-way passage of bees from said second chamber to said first chamber, said second passageway communicating with said one-way passage permitting means, said one-way passage permitting means comprising a tube having a side wall, at least one bee entrance opening and at least one bee exit opening, said tube containing a pair of flexible reeds convergent to said exit opening for permitting a single bee to pass in only one direction, said side wall defining said second gate, said tube further including means for defining a longitudinal slot adjacent said reeds, said second passageway including a lateral opening alignable with said tube slot to allow insertion of a rod transverse of said tube between said reeds.

4,094,027

INTERLOCKING TWO PIECE HULL FOR A CATAMARAN

Eugene G. Vernon, 2622 Crestview Dr., Newport Beach, Calif. 92105

Filed May 9, 1977, Ser. No. 794,726
Int. Cl.[2] B63B 5/24
U.S. Cl. 9—6 P 2 Claims



1. A hull for a catamaran, comprising:

a. a first member which has a sidewall that includes a first layer of fiberglass and polyester resin forming the exterior surface of said sidewall and a second layer of fiberglass and polyester resin forming the interior of said sidewall which is mechanically coupled to the first layer to form a structurally strong member, said first member having a band adjacent to its peripheral edge that is indented to form a ledge;

b. a second member which has a substantially vertical sidewall that includes a first layer of fiberglass and polyester resin forming the exterior surface of said sidewall and a second layer of fiberglass and polyester resin forming the interior of said sidewall which is mechanically coupled to the first layer to form a structurally strong member, said second member having the second layer of its said sidewall bent inwardly a slight amount adjacent to its peripheral edge in order that it may rest on said ledge of said first member along which it is joined, the first layer of said sidewall being adapted to rest directly on said ledge of said first member; and

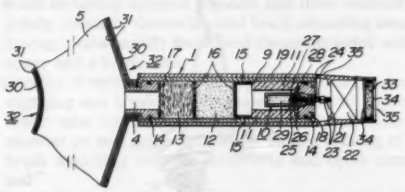
c. a third member which is mechanically coupled to said second member adjacent to its said peripheral edge along the interior surface of said vertical sidewall and which is adapted to be mechanically coupled to the interior surface of said first member and to be secured thereto by a glue.

4,094,028

AUTOMATIC INFLATING LIFESAVING BUOY

Hikaru Fujiyama; Tsuneo Kasama, both of Kawagoe, and Shigenobu Higuchi, Ashikaga, all of Japan, assignors to Nippon Oil and Fats Co., Ltd. and Kokuku Chemical Industry Co. Ltd., both of Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,424
Claims priority, application Japan, Apr. 1, 1976, 51-35126
Int. Cl.[2] B63C 9/18
U.S. Cl. 9—321 11 Claims



1. An automatic inflating lifesaving buoy comprising a gas generating device, an inflatable bag and an electric cell or battery, the gas generating device being provided with the electric cell or battery at the rearward end and the inflatable bag at the forward end, the gas generating device being a substantially hollow body in which an electric ignition device is arranged adjacent to the electric cell or battery and/is electrically connected with the electric cell or battery and surrounded with a gas generating composition, and a spacer provided in contact with and in the forward direction of the gas generating composition, a multi-perforated partition plate provided in contact with or integrated with the spacer, another multi-perforated partition plate provided in the forward direction of the first multi-perforated partition plate and at an appropriate distance to form a chamber wherein a cooling agent is charged, and an outlet for supplying generated gas to the inflatable bag through the second multi-perforated partition plate.

4,094,029

SHOE FASTENER

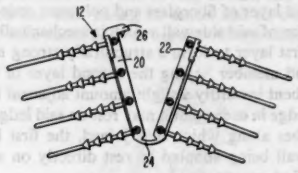
Alfred E. Carlile, 572 Chestnut St., Meadville, Pa. 16335

Filed Apr. 14, 1977, Ser. No. 787,698
Int. Cl.[2] A43D 5/00; F16G 11/00; A44B 17/00
U.S. Cl. 12—113 13 Claims

1. A fastener for a shoe which has opposite flaps with eyelets therein, the fastener comprising

a pair of elongated carriers,

hinge means connecting one ends of the pair of carriers together,
means for releasably securing the carriers together,
the pair of carriers having respective apertures,



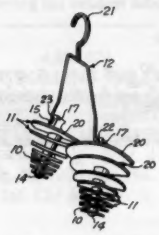
flexible string-like members joined to each of the carriers for passing through the eyelets of the shoe and for being received in the respective apertures, and
said flexible string-like members each having a protrusion for interlocking with the respective carrier at the respective aperture.

4,094,030

SHOE HANGER

Michel H. Saad, c/o Dana Electronic Computer Co. Inc., Bldg. 105, Spokane, Wash. 99216

Continuation-in-part of Ser. No. 652,625, Jan. 26, 1976, abandoned. This application Jul. 11, 1977, Ser. No. 814,184
Int. Cl.[2] A43D *5/00*; A47F *7/08*; A47J *51/00*
U.S. Cl. 12—116.8 **25 Claims**



1. A shoe hanger comprising:
elongated core means for longitudinal insertion between the vamp and insole of a shoe;
a plurality of projections resiliently mounted to the core means, each extending substantially transversely outward therefrom for deformable frictional engagement with inwardly facing interior surfaces of a shoe, said projections being spaced apart along the length of the core means;
and support means mounted to said core means;
the height and width across said projections being increased from front to back.

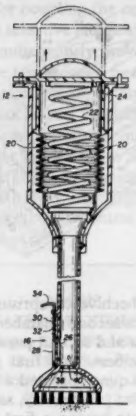
4,094,031

CLEANING APPARATUS FOR SELECTED SMALL AREAS OF A SWIMMING POOL

Alfonso J. Cellini, 11 Wheeler Ct., Deer Park, N.Y. 11729

Filed Dec. 20, 1976, Ser. No. 752,607
Int. Cl.[2] E04H *3/20*
U.S. Cl. 15—1.7 **1 Claim**

1. Cleaning apparatus for a swimming pool comprising an elongated air chamber, said air chamber having a bellows as an integral part thereof, means for venting the air from said air chamber, a spring within said air chamber for maintaining said air chamber in an elongated condition, at least one length of tubing having water-tight means for connecting one end of said tubing to said air chamber, means extending upwardly from said tubing to limit movement of said air chamber in said elongated condition, said spring and said bellows expelling air through said air chamber venting means and said tubing by operating said spring in conjunction with said air chamber, flap means within said tubing for the passage of air and water away from said air chamber and allowing the passing of debris only in the direction toward said air chamber, preventing and retaining said debris from passing away from said air chamber through said tubing when air is expelled through said tubing from the air chamber, and allowing the passage of said air being expelled from said air chamber, and a water-tight, spring loaded sliding trap door on said tubing between said air chamber and said flap means proximate to said/flap means for selectively retaining said debris passing through said tubing.

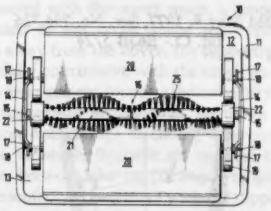


4,094,032

CLEANING DEVICE

Johannes Liebscher, Nassau (Lahn); Rolf G. Schülein, Singhofen, and Waldemar Fobbe, Nassau (Lahn), all of Germany, assignors to Leifheit International Gunter Leifheit GmbH, Nassau (Lahn), Germany

Filed Jan. 21, 1976, Ser. No. 650,942
Claims priority, application Germany, Jan. 24, 1975, 2502763
Int. Cl.[2] A47L *11/33*
U.S. Cl. 15—41 R **14 Claims**



1. In a device for cleaning surfaces, a combination comprising a housing; an elongated cleaning body having a longitudinal axis and including at least two separate cleaning sections each having an elongated shaft and a cleaning portion surrounding said shaft, and means for coaxially connecting said shafts, including a coaxial spherical male end portion of one of said shafts and a coaxial female end portion of the other shaft which includes elastically yieldable wall means embracing said male portion for independent rotation, and engaging behind said male portion with a snap action to prevent axial displacement, of the connected shafts relative to one another; means

for mounting said cleaning body in said housing for adjustment of the spacing of said longitudinal axis from a surface to be cleaned, including a generally U-shaped mounting element having two mounting portions extending transversely of, and an elongated connecting portion extending along, the mounted cleaning body and interconnecting said mounting portions, and a bracket affixed to said connecting portion intermediate said mounting portions, those end portions of said shafts that are remote from said male and female end portions being each mounted on one of said mounting portions of said mounting element, and at least one of said male and female end portions being supported on said bracket, for rotation relative thereto and for displacement therewith during the adjustment of said spacing; means for supporting said housing on the surface to be cleaned for movement relative thereto with said cleaning portions of said cleaning sections in contact therewith, including a plurality of wheels mounted on said housing for rotation in engagement with the surface being cleaned; and at least two motion-transmitting means each interposed between at least one of said wheels and one of said cleaning sections and operative for independently rotating the latter about said longitudinal axis in response to the rotation of said one wheel.

4,094,033

CLEANING DEVICE

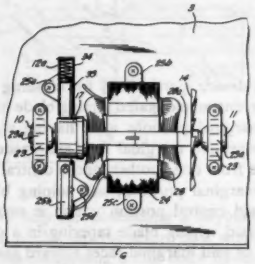
Klaus Stein, Velbert; Miroslav Aigl, Ennepal, and Gerhard Richter, Wuppertal, all of Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Germany

Filed Apr. 30, 1976, Ser. No. 682,173

Claims priority, application Germany, Apr. 30, 1975, 2519155

Int. Cl.[2] A47L *11/33*

U.S. Cl. 15—41 R **15 Claims**



1. In a cleaning device, particularly in a carpet-sweeping device, a combination comprising a housing bounding an internal space; cleansing means mounted on said housing; means for driving said cleaning means, including an electric motor accommodated in said space and having a stator and a rotor having an elongated shaft which has end portions, and means for so mounting said electric motor on said housing that said end portions of said shaft project from said stator, including at least two bearings each interposed between said housing and one of said end portions of said shaft at a distance from said stator; means for advancing a stream of a cooling medium through said space in a direction from one of said bearings toward said electric motor and toward the other of said bearings; and partitioning means located within said housing and including an L-shaped partition which has two arms one of which commences upstream of said electric motor as considered in said direction and extends alongside said electric motor, the other of said arms extending from said one arm transversely of and beyond said shaft between said electric motor and said other bearing, said partition subdividing said space into a first channel for a main stream of the cooling medium and accommodating said electric motor and a second channel for a branch stream of the cooling medium and accommodating said other bearing, for the branch stream to bypass said electric motor and thus remain effective for cooling said other bearing and to join the main stream only after cooling said other bearing and downstream of said electric motor for joint discharge from said space.

4,094,034

FLOOR TREATMENT MACHINES

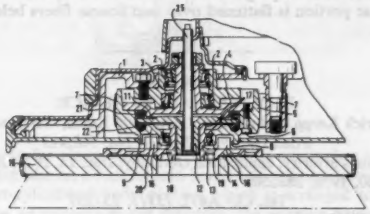
John Thomas Wilkins, Bushey Heath, and Haydn Frank Mayo, Hazlemere, both of England, assignors to R. G. Dixon & Company Limited, Wembley, England

Filed Mar. 2, 1977, Ser. No. 773,843

Claims priority, application United Kingdom, Mar. 4, 1976, 8742/76

Int. Cl.[2] A47L *11/162*

U.S. Cl. 15—49 R **14 Claims**



1. A floor treating machine comprising in combination:

a chassis;

a drive element within said chassis;

means for rotating said drive element only about a vertical axis passing through said chassis;

a brush mounting member adjacent said drive element and jointly rotatable therewith, said brush mounting member having a substantially horizontal flange provided with an upper and a lower side;

a plurality of resilient elements carried on said drive element engaging said brush mounting member on said upper and lower sides thereof and suspending said brush mounting member on said drive element for limited rocking of said brush mounting member relative to said drive element; and

a brush fixed to said brush mounting member and jointly displaceable therewith, whereby said brush rotates about the vertical axis passing through the chassis while rocking about the axis so as to maximize engagement of said brush with a floor surface.

4,094,035

CURLING BROOM

Fernand Marchessault, 2251 Sherbrooke Street, East, Montreal, Quebec, Canada

Filed Feb. 25, 1974, Ser. No. 445,814

Int. Cl.[2] A46B *3/06*; A63B *67/14*

U.S. Cl. 15—160 **5 Claims**

1. A broom comprising an elongated resilient means, a handle having one end secured to one end of said resilient means, and aligned therewith, fibers made of synthetic material, fixing

means securing said fibers to said one end of said handle, said fibers extending longitudinally of said resilient means, encompassing the latter, and arranged for flexion with said resilient means to be resiliently displaced by the latter, and a low binding loosely surrounding said fibers and maintained against longitudinal displacement relative to said handle, said low binding keeping said fibers against said resilient means, said resilient means including a bundle of coarse fibers of synthetic thermoplastic material, each having a cross-sectional area much larger than the cross-sectional area of the first-named fibers, said low binding loosely stitched through said bundle of coarse fibers, the ends of said coarse fibers secured to said handle being embedded in a solid plug, said plug holding said fiber ends together, and wherein said handle has a tubular portion and said plug and end portions of said coarse fibers embedded in said plug are fitted in said tubular portion and said tubular portion is flattened over said coarse fibers below said plug.

4,094,036

FLOOR CLEANING DEVICE

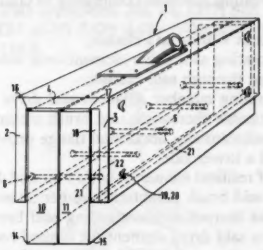
Heinrich Karpp, Fahrenberg 19 A, 4300 Essen, Germany

Filed Dec. 9, 1976, Ser. No. 748,913

Claims priority, application Germany, Dec. 13, 1975, 2556277; Jul. 20, 1976, 2632509

Int. Cl.² A47L *13/11, 13/257*

U.S. Cl. 15—244 R **3 Claims**



1. A device for cleaning surfaces, particularly floors, comprising a plurality of elongated cleaning elements of foam rubber which are symmetrical with reference to their central longitudinal and their central transverse axes, a plurality of cleaning edges extending longitudinally of each of said cleaning element at a predetermined distance from said axes, and a plurality of transverse passages which are distributed along said central longitudinal axes with spacing from one another in the central region of said cleaning element and extend through the latter; means for so receiving said cleaning element that any of said cleaning edges is in an exposed working position for a cleaning movement over a surface to be cleaned, including an elongated one-piece holding member of a generally U-shaped cross section having a bight and two arms rigid with one another and together bounding a recess for so partially accommodating said cleaning element that said passages extend from one to the other of said arms; means for connecting said cleaning element to said holding member, including a plate-shaped mounting member juxtaposable with said one arm within said recess, a plurality of connecting members of a number and distribution corresponding to those of said passages to be respectively received therein and affixed to said mounting member to extend therefrom toward said other arm, and detachable securing means for removably securing said plate-shaped mounting member to said one arm of said one-piece holding member, so that, upon release of said securing means and removal of the unit constituted by said plate-shaped mounting member from said recess and the cleaning element carried thereby, said cleaning element can be reoriented relative to said plate-shaped mounting member to put any other of said cleaning edges thereof into said exposed working position upon reintroduction of said plate-shaped mounting member into said recess; and an actuating handle rigid with said one-piece holding member and operative for moving the same with said plate-shaped mounting member and cleaning element connected thereto over the surface being cleaned with the respective cleaning edges in contact therewith.

4,094,037

WIPING DEVICE

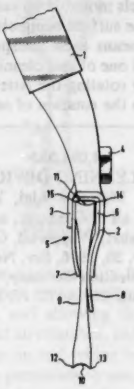
Heinrich Karpp, Fahrenberg 19 A, 4300 Essen 15, Germany

Filed Nov. 24, 1976, Ser. No. 744,606

Claims priority, application Germany, Nov. 26, 1975, 7537550[U]

Int. Cl.² A47L *1/06*

U.S. Cl. 15—245 **8 Claims**



1. A wiping device, particularly for cleaning windows and the like, comprising an elongated wiping blade having a pair of longitudinal marginal portions each having a pair of edges bounding a respective marginal face and spaced a predetermined distance from one another, and a central portion intermediate said marginal portions, said wiping blade having a thickness at said central portion which is smaller than said distance, and said wiping blade tapering in a direction from adjacent each of said marginal faces toward said central portion; a handle; and means for replaceably mounting said blade on said handle in four different orientations in each of which one of said edges is in a working position for use as a wiping edge, including wall means bounding an elongated cavity which is open at least at one longitudinal end thereof, and an elongated slot communicating said cavity with the exterior of said wall means along said cavity, said cavity being adapted to receive either one of said marginal portions of said blade whereas said central portion is accommodated in said slot and the other marginal portion extends beyond said wall means to the exterior thereof for said one edge thereof to be used for wiping.

4,094,038

WINDSCREEN WIPERS FOR AUTOMOBILE VEHICLES

Theodore Hancu, Geneva, Switzerland, assignor to Societe d'Exploitation de Brevets J.B., Fribourg, Switzerland

Filed Dec. 2, 1976, Ser. No. 746,962

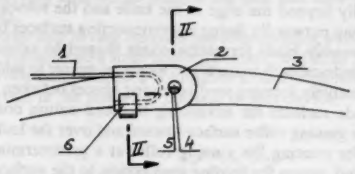
Claims priority, application Switzerland, Jan. 27, 1976, 975/76

Int. Cl.² B60S *1/40*

U.S. Cl. 15—250.32 **7 Claims**

1. A windscreen wiper of the type comprising a pivotal arm and a blade detachably mounted on the free end of the arm, a pin secured to one of said arm and blade and journalled in a

bore formed in the other of said arm and blade, said blade comprising a hook member which laterally projects with respect to the blade and is adapted to cooperate with the arm in the operating position to hold said pin in said bore.

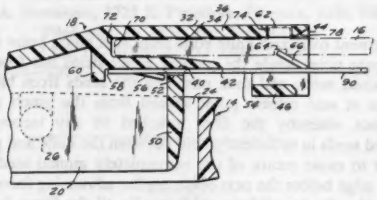


4,094,039

WINDSHIELD WIPER BAYONET CLIP WITH DOUBLE LATCH

Peter G. Waterman, Burlington, and Donald Earl Emmons, Brampton, both of Canada, assignors to Tridon Limited, Burlington, Canada

Continuation-in-part of Ser. No. 678,494, Apr. 20, 1976, abandoned. This application Feb. 4, 1977, Ser. No. 765,697
Int. Cl.[2] B60S 1/42
U.S. Cl. 15—250.32 8 Claims



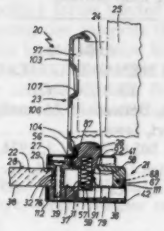
1. A connector clip for connecting a bayonet type windshield wiper arm to the superstructure of a windshield wiper assembly, said clip comprising a clip body having a first end portion including means for connecting the clip body to a windshield wiper superstructure and a second end portion adapted to operatively engage the free end of a windshield wiper arm, said second end portion having a top wall and an axially extended recess formed therein below said top wall defining a pocket which is generally complementary to said free end of the windshield wiper arm, for receiving said free end of the windshield wiper arm therein; said clip body including a spring mounting wall located adjacent said recess extending generally perpendicular to the recess and having a slot formed therein, and a relatively flat leaf spring element mounted in said slot and including an integral centrally located resilient tab in said spring adapted to be inserted with said spring through said slot, said tab extending in a downward direction opposite to the direction of insertion of the spring and being positioned to engage said support wall after insertion of the spring to prevent removal of said spring from the clip body, said spring element being located along said recess for engagement with said bayonet arm to aid in holding said arm in the clip; and an abutment wall located in spaced relation to said support wall on the side thereof opposite said pocket for engaging the end of the spring inserted through said slot and preventing movement thereof beyond the abutment wall whereby the spring is captured in a relatively fixed position in the clip body.

4,094,040

HINGE

Günter Schmid, Freudenstadt-Dietersweiler, and Christian Schaber, Lossburg, both of Germany, assignors to Hetal-Werke Franz Hettich KG., Alpirsbach, Germany

Filed Jun. 3, 1976, Ser. No. 692,552
Claims priority, application Germany, Jun. 3, 1975, 2524454
Int. Cl.[2] E05D 5/02
U.S. Cl. 16—191 20 Claims



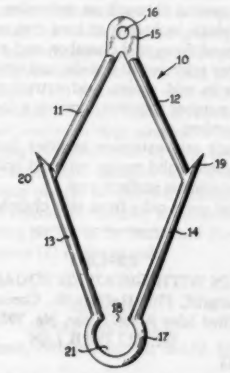
1. A hinge for mounting a structure such as a frameless glass door or the like on a fixture, said hinge comprising a substantially part-cylindrical body portion which is arranged to be inserted in an opening in the structure, the opening having a cross-section defined by a chord so as to provide, on the cylindrical surface of the body portion, a planar portion which, when the hinge is assembled on the structure is aligned with a longitudinal edge of the structure, said hinge including a pin extending parallel to the body portion and being spaced therefrom such that its axis lies on an imaginary line which passes through the axis of the body portion normal to said chord, to the side of the axis of the body portion remote from said chord, said pin being arranged to be inserted in a bore in the structure, and a connecting member hinged on the body portion and adapted to be mounted on the fixture.

4,094,041

DRESSING HOLDER FOR SMALL GAME

Earl B. Steed, P.O. Box 742, Jacksonville, Ark. 72076

Filed Apr. 18, 1977, Ser. No. 788,181
Int. Cl.[2] A22B 1/00
U.S. Cl. 17—44.2 5 Claims



1. A holder for facilitating dressing of small game comprising an upstanding diamond-shaped frame adapted for use in a position in which the vertices of the obtuse angles are diametrically opposed and the longitudinal axis of the diamond-shaped frame passes vertically in bisecting relationship with the upper acute angle defined by the upper pair of legs of said frame, a pointed projection extending outwardly and upwardly from

each of the junctions of the upper and lower legs of said frame which define one of said obtuse angles, and a downwardly directed loop portion joined coextensively to transversely spaced lower ends of the downwardly converging lower legs of said frame, the maximum transverse width of the enclosure defined by said loop portion being less than the maximum transverse width of the enclosure defined by said diamond-shaped frame, and the separation of said transversely spaced lower ends being less than the maximum interior transverse width of said arcuate loop portion.

4,094,042

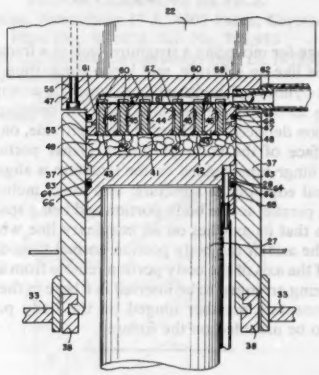
METHOD FOR REMOVING MEAT FROM BONE FRAGMENTS

Roy Settle Rousseau, Bettendorf, IA, assignor to The Kartridg Pak Co., Davenport, Iowa

Division of Ser. No. 505,977, Sep. 3, 1974, Pat. No. 4,025,985. This application Oct. 15, 1976, Ser. No. 732,766

Int. Cl.[2] A22C *17/00*

U.S. Cl. 17—46 **5 Claims**



1. A method for removing and recovering meat from a mass of bone fragments comprising the steps of:

compressing said mass in means providing a chamber to form a press cake of substantially reduced volume;

collecting the meat which extrudes from the mass during said compression through an extrusion head having an extrusion block including at least one recess for passing extruded meat from said chamber, and at least one extrusion member interspaced therein; and extendable from and retractable in said recess, said extrusion block and said extrusion member together forming a foraminous surface in said chamber;

extending each said extrusion member from said recess to release residual solid matter retained within the foramina of said foraminous surface; and

removing said press cake from said chamber.

4,094,043

ROLLER GIN WITH GROOVED SQUARE ROTOBAR

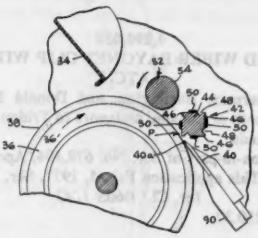
Arvel L. Vandergriff, 1701 Heffner St., Corcoran, Calif. 93212

Filed May 9, 1977, Ser. No. 795,182

Int. Cl.[2] D01B *1/06*

U.S. Cl. 19—53 **21 Claims**

1. A roller cotton gin comprising a ginning roller having a friction surface for conveying lint fibers to a pinch point station and a fixed knife for separating the lint fibers from cotton seed having an upstream facing working edge at the pinch point located substantially tangentially of and in contact with the surface of said ginning roller, a rotary feed blade rotobar member spanning the width of the gin having a center axis and shaped at circumferentially spaced locations to form at least four forwardly facing blade surface formations spanning the gin width having outer edges located to sweep through an arcuate cylindrical path whose diameter is a small fraction of the ginning roller diameter downwardly toward, over and forwardly beyond the edge of the knife and the rotobar member having outwardly facing interconnecting surfaces between the successive blade formation edges shaped to extend from said cylindrical path inwardly to locations nearer to said center axis effectively forming seed-receiving spaces between successive blade surfaces for advancing the seed cotton coactively with the ginning roller surface toward and over the knife edge, means for rotating the ginning roller at a predetermined surface speed, means for feeding seed cotton to the surface of the ginning roller at a location upstream of said knife edge to cause the ginning roller to strip lint from seeds which are restrained by the knife edge and convey the lint to a point of removal, and means for rotating said rotobar member at a speed causing the surface speed of the edges of said blade surfaces to be slightly less than the surface speed of said ginning roller such as to restrain seeds in said seed-receiving spaces during seed advancement over said knife edge from said pinch point toward a release point while the ginning roller strips lint from such restrained seeds and then releasing the seeds from blade restraint at said release point spaced from the pinch point a distance whereby the fiber attached to any incompletely ginned seeds in sufficiently held between the knife and ginning roller to cause return of the incompletely ginned seed to the knife edge before the next blade applies advancing force to the seed, thereby to witdraw substantially all the fibers from the seed so long as sufficient fibers remain attached to the seed to continue drawing the seed back to the pinch point after each release thereof, and a narrow strip-like pad of flexible material fixed on and spanning the axial length of each of said outwardly facing interconnecting surfaces substantially midway between each of the successive blade formation edges to press the seed locks in said seed- receiving spaces between successive blade formation edges against the ginning roller surface immediately upstream of said working edge of said knife and reduce the occurrence of unginned locks.



4,094,044

TENSIONING DEVICE FOR TIGHTENING AND SECURING A HOLDING STRAP

J. O. Coker, 396 Hickory St., Lewisville, Tex. 75067

Filed Aug. 23, 1976, Ser. No. 716,436

Int. Cl.[2] A44B *21/00*

U.S. Cl. 24—68 CD **1 Claim**

1. A strap tensioning device for tightening and securing a holding strap in a tensioned position comprising:

a bracket means including a pair of spaced apart arm portions,

a pin interconnected between said arm portion adjacent one end thereof,

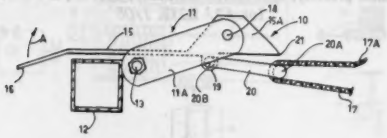
a handle means including a pair of opposed side leg members and a web portion interconnected therebetween,

said web portion having a transverse edge portion at one end and having a reduced extension defined as an extended handle portion disposed opposite to said edge portion,

pivot pin connecting the opposite side leg members of said handle means to the other end of a corresponding bracket arm portion,

a strap ring adapted to receive the free end of a holding strap,

said strap ring having opposed portions defining a ring hinging portion and a strap holding portion, said strap holding portion being disposed contiguous to said transverse edge portion in the tensioned position of said device,



means for pivotally connecting said ring hinging portion to said web portion whereby the pivot means of said strap ring is disposed between the ends of said arm portions in the loosened position of a strap, and

whereby the holding strap is tightened and secured by rotating said handle means approximately 180° so that the pivot means of said strap ring is located beyond the end of said arm portions of said bracket means, and whereby said transverse edge and strap holding portion clamps said strap therebetween upon rotating said handle means toward a tightened position.

4,094,045

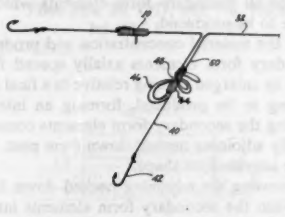
COUPLING DEVICE AND METHOD

Curtis A. Stevenson, 3722 E. Pasadena, Phoenix, Ariz. 85018

Filed Apr. 30, 1976, Ser. No. 681,801

Int. Cl.[2] F16G *11/00;* **A01K** *91/04*

U.S. Cl. 24—131 C **6 Claims**



1. A coupling device for releasably interconnecting a first length of flexible line having a loop disposed at the connecting end thereof with a second length of flexible line, said coupling device comprising in combination:

a. a continuous uninterrupted coiled spring member for receiving and lockingly gripping segments of the first and second lengths of flexible line intermediate selected ones of the coils of said spring member, said spring member including a central channel extending therethrough;

b. a first coil section for engaging the first and second lengths of flexible line and formed as one part of said continuous uninterrupted spring member, said first coil section defining one part of said central channel, said first coil section including a first terminal coil for penetrably engaging the loop of the first length of flexible line brought through said central channel to said first terminal coil;

c. a second coil section for supporting a folded over section of the second length of flexible line and formed as another part of said continuous uninterrupted spring member, said second coil section defining another part of said central channel, said second coil section including a second terminal coil for supporting the folded over section of the second length of flexible line brought through said central channel in a direction opposite that of the first length of flexible line;

d. a gap disposed intermediate two adjacent coils of said continuous uninterrupted spring member for segregating said first coil section from said second coil section, said gap providing access to penetration intermediate two coils of said first section by the folded over segment of the second length of flexible line extending from said second terminal coil and along the outer periphery of said second coil section;

whereby, opposed pulling forces exerted upon the first and second lengths of flexible line compress the coils of said first coil section to grip the loop of the first length of flexible line penetrably engaged by said first terminal coil and the folded over segment of the second length of flexible line disposed intermediate two coils of said first coil section.

4,094,046

SEAT BELT BUCKLE

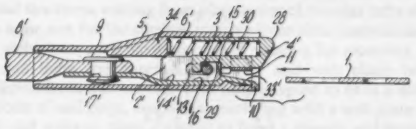
Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1976, Ser. No. 714,543

Claims priority, application Japan, Aug. 19, 1975, 50-113475

Int. Cl.[2] A44B *11/25*

U.S. Cl. 24—230 AK **2 Claims**



1. A seat belt buckle in which a tongue piece (1) is engaged or disengaged with the buckle characterized in that a frame (2) consisting of a base plate (14) and opposed side plate (12) that are directed upwardly from both sides of said base plate (14) has an engaging protrusion (15) and a base surface (16) that will accept said tongue piece (1); slots 13 that are nearly parallel with said base surface (16) are provided in both side plates (12) at near a tip position of said tongue piece (1) that is inserted beyond said engaging protrusion (15), and an elevation preventing pin (3) which prevents the elevating motion of the tongue piece (1) slideably engages and extends between said slots (13), an operation slide member (4') having a recess (29) of a length greater than the width of and engaging said elevation preventing pin, a transversely extending guide plate (11) which is fastened between the two side plates (12) of the frame (2); above the protrusion (15) restricting said slide member to a longitudinal movement; a buckle cover (5) having an exposure hole to expose said operation slide member is mounted on said frame 2, and a spring (6) is provided between said buckle cover (5) and said operation slide member in a manner that said elevation preventing pin (3) is resiliently biased to a forward position; and said operation member is operated to move the elevation preventing pin (3) in the backward direction in order that the tongue piece (1) is disenaged.

4,094,047

SNAP SHACKLE

Gunilla A. Carlsson, Skidbacken 38, S-172 45, Sundbyberg, Sweden

Filed Feb. 11, 1976, Ser. No. 657,314

Claims priority, application Sweden, Feb. 18, 1975, 7501798

Int. Cl.[2] A44B *13/00;* **B64D** *17/38*

U.S. Cl. 24—241 R **6 Claims**

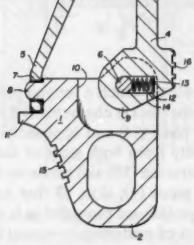
1. Snap shackle comprising:

a stationary fastener body (1) provided with attachment means (2) and locking means (8), and having a slot (10) therein;

a generally U-shaped closure link (3) rotatably mounted to said fastener body (1) via a shaft (6) and rotatable through an angle of about 90 degrees relative to said fastener body (1), said fastener body (1) and said closure link (3) together defining an openable loop which is restricted by at least part of said fastener body (1) and by at least part of said closure link (3), said openable loop being separated from said attachment means (2);

said generally U-shaped closure link (3) having first and second longitudinally extending shanks (4,5) which are adapted to be bridged by at least part of said fastener body (1), said first shank (4) being at one end rotatably and linearly laterally displaceably mounted in said fastener body (1) via said shaft (6), said one end of said first shank being further provided with bearing means (9) which is guided in said slot (10) to permit rotational movement of said first shank through an angle of about 90 degrees as well as linear and lateral displacement of said first shank relative to said fastener body (1), and said second shank (5) at one end being provided with locking means (7) for selective engagement with said locking means (8) of said fastener body (1), said locking means being disengagable by a lateral movement of said link relative to said fastener body;

said shaft (6) being fixedly connected to one of said fastener body and closure link (3), an elongated laterally disposed groove (12) being provided in the other of said fastener



body (1) and closure link (3), said shaft (6) passing through said groove (12), and wherein a spring (14) is arranged in said groove (12) between said shaft (6) and one end of said groove (12) to bias said shaft (6) toward the other end of said groove (12) and to permit said linear lateral displacement of said closure link (3) relative to said fastener body (1);

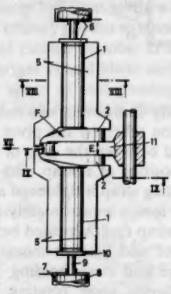
said first shank (4) at its said one end being further provided with a manually engagable first pressure surface (16) extending outwardly of said fastener body (1) in the lateral direction of said U-shaped closure link (3), said fastener body (1) having a manually engagable second pressure surface (15) on the opposite side of said shaft (6) and spaced laterally and longitudinally away from said shaft (6) in the direction away from the closure link (3), said first pressure surface (16) facing away from said second pressure surface (15) and said pressure surfaces being oriented for application of a compressive force therebetween to simultaneously laterally displace and rotate said closure link (3) in the opening direction relative to said fastener body (1), whereby upon manual application of a compressive force substantially perpendicular to said pressure surfaces said first pressure surface (16) is displaceable towards said fastener body (1) to displace said one end of said second shank (5) away from said fastener body (1) to bring said locking means (7) of said second shank (5) and said locking means (8) of said fastener body (1) out of engagement with one another, thereby permitting said closure link (3) to rotate at least partially under the influence of said compressive force through an angle of about 90 degrees relative to said fastener body (1) to an open position to open said openable loop.

4,094,048

METHOD OF HEAT FORMING OF WORKPIECES

Gerhard Broder, Dusseldorf, Germany, assignor to Franz Berrenberg, Haan, Germany

Filed Nov. 17, 1976, Ser. No. 742,646
Claims priority, application Germany, Sep. 25, 1976, 2643340
Int. Cl.[2] B21K *1/08*
U.S. Cl. 29—6 **3 Claims**



1. A method for heat shaping of workpieces with at least two secondary form elements lying nonsymmetrically to the axis of the main form elements and spaced slightly from one another, particularly crankshafts, comprising the steps of

heating rod shaped starting material in the range of secondary elements to be formed thereon,

axially compressing the heated rod shaped starting material and producing one enlarged material concentration in common for all secondary form elements which subsequently are to be produced,

drop-forging the material concentration and producing the two secondary form elements axially spaced from one another by an enlarged spacing relative to a final form and final spacing to be produced, forming an intermediate shape having the secondary form elements connected by an integrally adjoining necked down form part,

trimming the intermediate shape,

axially compressing the adjoining necked down form part lying between the secondary form elements into a final enlarged cylindrical shape with simultaneous calibration of the final spacing between the secondary form parts, thereby producing the final form and final spacing,

performing the compressing of the adjoining necked down form part lying between the secondary form elements as well as the simultaneous calibration of the final spacing between the secondary form parts by inserting a floating gauging saddle therebetween and axially compressing the main form elements.

4,094,049

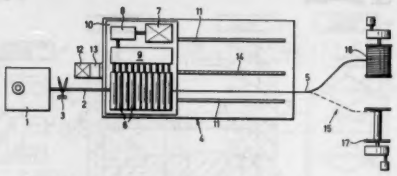
CASTING ROLLING MILL FOR WIRE

Ali Bindernagel, Wermelskirchen, Germany, assignor to Friedrich Kocks GmbH, Dusseldorf, Germany

Filed Aug. 20, 1976, Ser. No. 716,189
Claims priority, application Germany, Sep. 6, 1975, 2539697
Int. Cl.[2] B21B *15/00*; B23P *19/02*; B22D *11/124*
U.S. Cl. 29—33 C **5 Claims**

1. A continuous casting and rolling plant for wire, particularly non-ferrous wire, comprising a continuous casting unit continuously casting a strand of metal to be formed, replaceable coiling means spaced from the casting unit, a rolling means intermediate the casting unit and coiling means having a

roll pass line receiving said strand for conversion to wire, said rolling unit being movable selectively from a position adjacent said casting unit to a position adjacent said coiling unit and back to the position adjacent the casting unit, means adjacent the casting unit for selectively severing the strand, means acting on the rolling unit each time the strand is cut moving said rolling unit toward the coiling means at substantially the



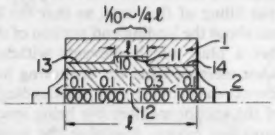
rate of advance of the cast strand with the rolling unit operating at normal operating speed, means for replacing the coiling means each time a coil is completed, means for attaching a wire end from the rolling unit to the coil means and means for reversing the rolling unit to move it back to a position adjacent the casting unit with the strand continuing to pass through the roll pass line for conversion to wire.

4,094,050

BACKUP ROLL OF THE BUILT-UP TYPE

Hiroshi Goto, Muroran, Japan, assignor to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Feb. 14, 1977, Ser. No. 768,616
Int. Cl.² B21B *31/08*
U.S. Cl. 29—129.5 **6 Claims**



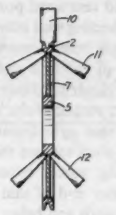
1. In a backup roll of the built-up type comprising an arbour and a sleeve which is shrinkage-fitted on said arbour, the combination of an inward stepped shrinkage-fitting portion and outward shrinkage-fitting portions provided on the shrinkage-fitting surface formed between the outer surface of said arbour and the inner surface of said sleeve, said inward stepped shrinkage-fitting portion being formed on substantially a mid portion of said shrinkage-fitting surface by an annular protrusion around said arbour having a limited length of substantially one tenth to one fourth of the axial length of said shrinkage-fitting surface and an annular dent around said sleeve of a size corresponding to said protrusion, said outward shrinkage-fitting portions being formed on said shrinkage-fitting surface at both sides of said inward stepped shrinkage-fitting portion so as to extend to the outer ends of said shrinkage-fitting surface, the shrinkage ratio of said inward stepped shrinkage-fitting portion being a value which can afford a torque transmission between said arbour and said sleeve and the shrinkage ratio of said outward shrinkage-fitting portions being less than that of said inward shrinkage-fitting portion.

4,094,051

METHOD OF MAKING SHEAVES

Homer J. Woolslayer; Cecil Jenkins, and Robert D. Woods, all of Tulsa, Okla., assignors to Lee C. Moore Corporation, Tulsa, Okla.

Filed May 16, 1977, Ser. No. 797,333
Int. Cl.² B21K *1/42*
U.S. Cl. 29—159 R **3 Claims**



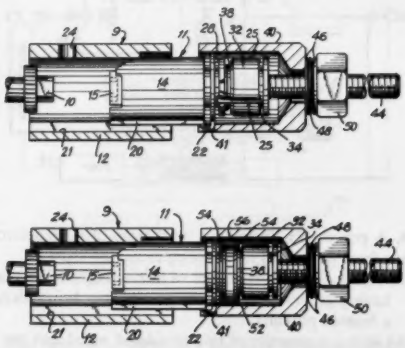
1. A method of making a set of wire line sheaves to be mounted side by side on a common axis, comprising selecting a plate of substantially the same thickness as the maximum width of the desired sheave rims, cutting from the plate a series of adjoining concentric rings all having substantially the same radial thickness, cutting from plate material circular hubs all of the same size for the sheaves, cutting from plate material annular web plates each having a central opening for receiving one of said hubs, the outer diameters of said web plates being different from one another with each adapted to fit in a different one of said rings, assembling each ring with a web plate and hub and welding them together to form a sheave, and forming a circumferential groove in the periphery of each ring to form a grooved rim for receiving a wire line.

4,094,052

LOCK REMOVAL TOOL

George V. Iaccino, New Rochelle, N.Y., assignor to Lock Technology, Inc., New Rochelle, N.Y.

Filed May 25, 1977, Ser. No. 800,319
Int. Cl.² B23P *19/04*
U.S. Cl. 29—263 **9 Claims**



6. A tool for removing a lock cylinder from a lock housing, the cylinder being of the type having a shell with a plug rotatably mounted therein, said plug having a circular flange projecting out from the forward end of the shell, said tool comprising:

a cylindrical inner member having forward and rearward longitudinal portions, said forward portion having an overall diameter less than that of said rearward portion,

said forward and rearward portions having first and second circumferential grooves cut thereon, respectively, the overall diameter of said flange being substantially equal to one of the overall diameters of said forward and rearward portions;

a hollow outer shell having an axial bore extending from one end thereof, said outer shell having a wall at its other end provided with an opening therein, the diameter of the bore being a predetermined amount greater than the overall diameter of said rearward portion;

coupling means for joining said inner member to said flange, said coupling means being formed with means at its ends for engaging one of the first and second circumferential grooves on said cylindrical inner member and the underside of said flange, respectively; and

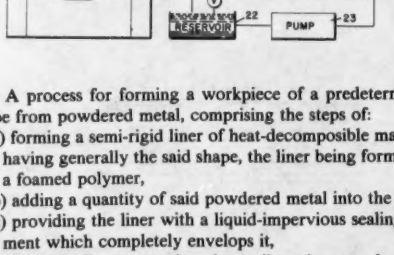
means for drawing said cylindrical inner member into the bore of said outer shell toward the other end of said outer shell, said drawing means extending out through said opening in the other end of said outer shell in operative engagement therewith and being connected to the end of the rearward portion of said inner member, whereby when said coupling means engages a selected one of the first and second grooves and the underside of said flange, and said drawing means is operated, said inner member transmits an outwardly directed force onto the lock cylinder through said coupling means and said flange to withdraw the cylinder from the housing when said outer shell is maintained stationary with respect to the housing.

4,094,053

FORGING PROCESS

Elbert K. Weaver, Westboro, Mass., assignor to Wyman-Gordon Company, Worcester, Mass.

Filed May 21, 1976, Ser. No. 688,620
Int. Cl.² B22F *3/24, 1/00*
U.S. Cl. 29—420 **3 Claims**



3. A process for forming a workpiece of a predetermined shape from powdered metal, comprising the steps of:

(a) forming a semi-rigid liner of heat-decomposible material having generally the said shape, the liner being formed of a foamed polymer,

(b) adding a quantity of said powdered metal into the liner,

(c) providing the liner with a liquid-impervious sealing element which completely envelops it,

(d) isostatically compacting the sealing element, the liner and the contents,

(e) heating the liner and contents to cause decomposition of the liner and sintering the contents, and

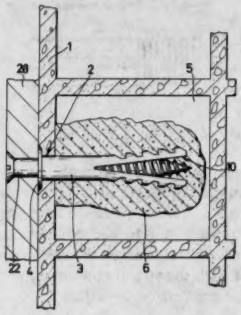
(f) forging the contents, wherein the sealing element is a thin elastomer bag in which the liner is enclosed, which bag is removed before the liner and contents are heated.

4,094,054

METHOD OF SECURING AN OBJECT TO A LOW-STRENGTH SUPPORT STRUCTURE

Artur Fischer, Weinhalde 34, Tumlingen, Germany

Continuation-in-part of Ser. No. 616,072, Sep. 23, 1975, abandoned. This application Oct. 1, 1975, Ser. No. 617,832
Claims priority, application Germany, Oct. 3, 1974, 2447189
Int. Cl.² B23P *3/00, 19/04*
U.S. Cl. 29—460 **6 Claims**



1. A method of installing an expansion anchor member in a low-strength support structure having internal cavities bounded by walls, comprising the steps of providing an anchoring hole in the support structure; inserting a leading end portion of an expansion anchor member having an internal passage and leg portions into the hole so that a leading end region of the passage communicates with an internal cavity of the structure; providing an injection device with a source of quick-setting substance; inserting the injection device into a trailing end region of the passage; only partially filling the internal cavity with the quick-setting substance by actuating the injection device and injecting the quick-setting substance through the passage to the circumambient region of the leading end portion of the expansion anchor member at a rate such that hardening of the quick-setting substance begins upon the emergence of the substance into the internal cavity and is completed upon the partial filling of the same, so that the quick-setting substance forms about the leading end portion of the expansion anchor member a plug which prevents withdrawal of the expansion anchor member from the anchoring hole and relative to the internal cavity, said plug surrounding the leading end portion of the anchor member but being spaced from the walls of a respective cavity; removing the injection device from the passage of the anchor member; and screwing a mounting screw into the passage of the anchor member only after the injected quick-setting substance is hardened, so that the leg portions move apart from one another by a limited distance and the screw becomes secured in the anchor member.

4,094,055

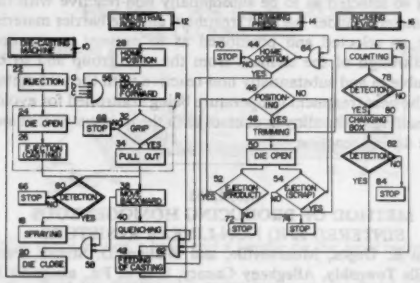
AUTOMATIC WORKING METHOD OF CASTINGS

Toshiki Morimoto, Kawasaki, Japan, assignor to Mitsui Mining and Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1977, Ser. No. 782,367
Int. Cl.² B22D *17/32*
U.S. Cl. 29—527.6 **15 Claims**

1. An automatic working method of castings which comprises the operation of a casting machine including the steps of spraying a release agent, injecting raw material into a casting die, opening the casting die, and ejecting a casting from the casting die; the operation of an industrial robot having an arm restoring said robot to its original position, advancing the robot arm, gripping the casting by the robot arm, pulling out the casting from the casting die by the robot arm, retracting the robot arm, quenching the casting, and transferring the

quenched casting to the succeeding trimming press; the operation of the trimming press including restoring the press to its original position, setting the casting in a prescribed position relative to the trimming press, separating the upper and lower press die members, removing the trimmed casting from the trimming press and discharging scrap from the trimming press; detecting whether the casting is properly set in the trimming

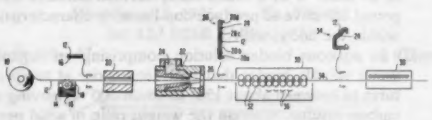


press for trimming; removing the casting from the trimming press without trimming, in case the casting fails to be properly set; detecting whether the casting machine, industrial robot and trimming press are carrying out the prescribed steps under a normal condition; and immediately stopping the machine which has been found by the detecting step to present a failure to perform any of the prescribed steps included in the operation of said machine.

4,094,056
DECORATIVE TRIM STRIP

Shinji Takeda; Shoji Kobayashi, and Yutaka Watanabe, all of Kariya, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 2, 1977, Ser. No. 773,757
Claims priority, application Japan, Aug. 20, 1976, 51-99481
Int. Cl.² B21D *5/06*; B29F *3/00*
U.S. Cl. 29—527.2 **7 Claims**



1. A process for forming a decorative strip comprised of an elongated metal strip and a thermoplastic portion affixed thereto, comprising the steps of:

(a) supplying and transporting a continuous length of said metal strip;

(b) extruding thermoplastic material onto said strip while transporting said strip, said strip being at least partially surrounded by said material;

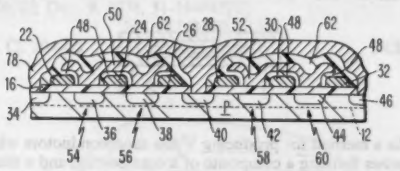
(c) forming said material around said strip to a first predetermined cross sectional shape, said shape including at least one longitudinal groove in said material; and

(d) sequentially shaping said strip and said material surrounding said strip by bending said strip and said material to a second predetermined cross sectional shape, said strip being bent longitudinally at a location adjacent the root of said groove, thereby closing said groove, said shaping step including heating of said thermoplastic material to induce fusion of said material where said material on one side of said groove is in contact with material on the other side of said groove.

4,094,057
FIELD EFFECT TRANSISTOR LOST FILM FABRICATION PROCESS

Arup Bhattacharyya, and Ronald Silverman, both of Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,907
Int. Cl.² H01L *21/26*
U.S. Cl. 29—571 **12 Claims**



1. A method for forming an electrical circuit in an isolated pocket of semiconductor material including a transistor having a control electrode and at least one current carrying electrode comprising the steps of:

forming a thin insulator at the surface of said semiconductor material,

depositing a masking material on said insulator,

selectively etching said deposited mask material to define a plurality of openings in said mask,

depositing an anodizable conductive material in the openings defined in said mask material,

anodizing the surface of said anodizable material,

selectively removing the remainder of said mask material,

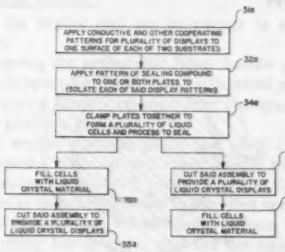
forming source and drain regions in said semiconductor material, and

depositing conductive material to form an electrical connection to one of said source and drain regions.

4,094,058
METHOD OF MANUFACTURE OF LIQUID CRYSTAL DISPLAYS

Akira Yasutake, and Shigemitsu Kiso, both of Kyoto, Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Jul. 23, 1976, Ser. No. 708,027
Int. Cl.² G02F *1/13*
U.S. Cl. 29—592 R **9 Claims**



1. The method of forming a plurality of individual crystal displays which comprises the steps of applying a conductive pattern to one surface each of a pair of substrates, said pattern cooperating when the substrates are face to face to form said plurality of displays, providing sealing means on at least one of said surfaces prior to bringing said surfaces together and in a pattern isolating each of said plurality of displays to form a plurality of display cells, filling said cells with liquid crystal material, sealing said cells by bringing said substrates together and cutting said substrates to form said displays.

4,094,059
METHOD FOR PRODUCING COMPOSITE SUPERCONDUCTORS

Kyoji Tachikawa, Tokyo, and Kikuo Itoh, Yokohama, both of Japan, assignors to National Research Institute for Metals, Japan

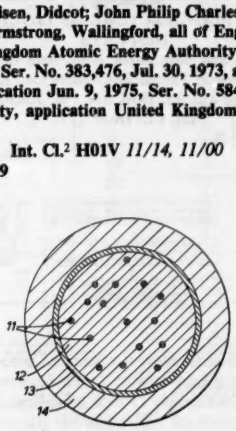
Filed Sep. 15, 1975, Ser. No. 613,274
Claims priority, application Japan, Sep. 18, 1974, 49-106631
Int. Cl.[2] H01B *12/00*; H01V *11/00*
U.S. Cl. 29—599 17 Claims

1. In a method for producing V_3Ga superconductors which comprises forming a composite of a core portion and a sheath portion surrounding said core portion, said sheath portion being composed of a gallium-containing alloy selected from the group consisting of copper-gallium, silver-gallium and copper-silver gallium alloys, and said core portion being composed of a vanadium metal selected from the group consisting of vanadium and vanadium alloys containing from 0.1 to 10 atomic percent of titanium, zirconium or hafnium; elongating said composite; and heat-treating the resulting elongated composite to form a V_3Ga layer between said sheath and core portions; the improvement comprising including a continuous portion of aluminum or an aluminum alloy in said composite prior to elongating the same, wherein said continuous portion of aluminum or aluminum alloy is provided between said sheath and core portions and completely surrounds and is in contact with said core portion at the beginning of said heat-treating, and wherein said aluminum or aluminum alloy diffuses into said sheath portion by said heat treatment and promotes the formation of V_3Ga.

4,094,060
SUPERCONDUCTING MEMBERS AND METHODS OF MANUFACTURE THEREOF

Peter Emil Madsen, Didcot; John Philip Charlesworth, Witney, and Derek Armstrong, Wallingford, all of England, assignors to United Kingdom Atomic Energy Authority, England

Continuation of Ser. No. 383,476, Jul. 30, 1973, abandoned. This application Jun. 9, 1975, Ser. No. 584,905
Claims priority, application United Kingdom, Aug. 4, 1972, 36637/72
Int. Cl.[2] H01V *11/14, 11/00*
U.S. Cl. 29—599 5 Claims

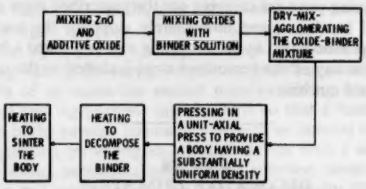


1. A method of manufacturing a superconducting member, which method comprises the steps of forming an alloy consisting essentially of a carrier material and at least one element from the group consisting of aluminium, gallium, indium, silicon, germanium, gold, platinum, antimony, rhodium, zirconium, palladium, osmium, ruthenium, cobalt, thallium, lead, arsenic, bismuth, iridium and tin; contacting the alloy with a base material consisting essentially of niobium or vanadium; consolidating into a unitary structure components comprising the alloy and the base material together with a metal, which is eventually to provide stabilisation, a barrier material consisting essentially of tantalum or molybdenum being present and positioned to protect the said metal from diffusion thereinto of any of the other components; mechanically working the said unitary structure to form a wire therefrom, and heat treating the said wire to cause a solid state reaction between the base material and the element or elements from the said group to form a superconducting compound therewith, the carrier material being so selected as to be substantially non-reactive with the base material under the heat treatment and the barrier material being so selected and positioned as to prevent permeation therethrough of the element from the said group and to be insoluble in and substantially non-reactive with the said metal, and the heat treatment temperature being controlled for avoiding melting of the alloy in contact with the base material at any stage during reaction.

4,094,061
METHOD OF PRODUCING HOMOGENEOUS SINTERED ZNO NON-LINEAR RESISTORS

Tapan K. Gupta, Monroeville, and William D. Straub, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1975, Ser. No. 631,297
Int. Cl.[2] H01C *7/02*
U.S. Cl. 29—612 9 Claims


MIXING ZnO AND ADDITIVE OXIDE
MIXING OXIDES WITH BINDER SOLUTION
DRY-MIX-AGGLOMERATING THE OXIDE-BINDER MIXTURE
PRESSING IN A UNIT-AXIAL PRESS TO PROVIDE A BODY HAVING A SUBSTANTIALLY UNIFORM DENSITY
HEATING TO DECOMPOSE THE BINDER
HEATING TO SINTER THE BODY

1. A method of making a homogeneous, sintered, resistor body, having a substantially uniform density, which can exhibit nonlinear V-I characteristics, comprising the steps of:

(A) mixing:

(1) a solid particle composition admixture of 75 mole % to 98 mole % of small, finely divided ZnO and 2 mole % to 25 mole % of a small, finely divided additive compound effective to produce non-linearity characteristics within the body, with

(2) an aqueous binder solution comprising an organic, water soluble binder that will decompose at temperatures of between about 150° to about 600° C leaving no carbon residue, wherein the weight ratio of solid particles:binder is between about 100:1 to about 100:10, to provide a mixed particle-binder slurry, and then

(B) simultaneously drying, mixing and agglomerating the slurry to form a mass of larger spherical particles, the agglomerated particles having an average particle size of between about 0.5 micron to about 500 microns diameter, and at least 50 wt.% of the agglomerated particles have an average particle size between 25 microns to about 500 microns, said particles containing binder, ZnO and additive compound distributed therethrough, and then

(C) pressing a mass of the agglomerated particles in a uniaxial press, at between about 36 kg./sq. cm. to about 1,500 kg./sq. cm., to provide a body having a substantially uniform density, and then

(D) heating the pressed body:

(1) first at a temperature of between 25° and about 600° C, at a temperature rate increase of between 10° C/hr. to about 45° C/hr., effective to slowly decompose and remove the binder, and then

(2) between about 625° to about 1,400° C, at a temperature rate increase of between about 75° C/hr. to about 150° C/hr., for a time effective to sinter together the parti-

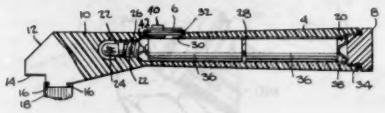
cles of the pressed body, thereby forming a homogeneous sintered body having a substantially uniform density, exhibiting non-linear V-I characteristics.

4,094,062

ILLUMINATED RAZOR

Sotirios Papanikolaou, 407 Church St., Hasbrook Heights, N.J. 07604

Filed Mar. 4, 1976, Ser. No. 663,980
Int. Cl.[2] B26B *19/46*
U.S. Cl. 30—34 R 5 Claims



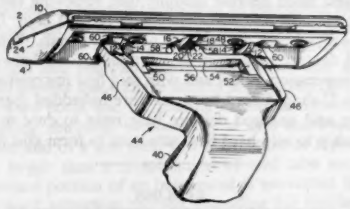
1. A razor having a head and a handle on the head comprising:
(a) means for mounting a razor blade on the front of the head;
(b) a razor blade mounted on the front of the head facing outwardly from the head and the handle;
(c) an electrical circuit entirely within the handle of the razor;
(d) a power source in the electrical circuit;
(e) a light bulb in the circuit;
(f) a razor head formed of transparent material having a rear surface arranged at an angle between 30° and 60° to the axis of the razor handle for directing the light from the bulb to the area above the razor blade in the direction which the razor blade faces;
(g) a coating of an opaque reflective substance on the rear surface of the razor head;
(h) a switch in the circuit; and
(i) means for sealing the electrical circuit from water.

4,094,063

RAZOR ASSEMBLY WITH PIVOTALLY MOUNTED CARTRIDGE

Robert Anthony Trotta, Winthrop, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Dec. 15, 1976, Ser. No. 750,958
Int. Cl.[2] B26B *21/06, 21/22*
U.S. Cl. 30—47 2 Claims



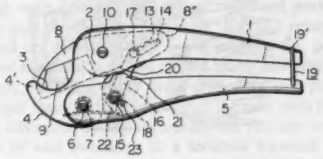
1. Razor assembly comprising a shaving unit and a handle, said shaving unit having platform means, blade means, first pivotal mounting means for pivotally connecting said shaving unit to said handle, and cam means for receivng a biasing force from said handle, said handle including a head portion having arm means with second pivotal mounting means complemental to said first pivotal mounting means and a resilient member anchored at either end thereof to said head portion, said resilient member comprising first and second legs upstanding from said head portion and a bridge portion extending between the first and second legs and otherwise removed from said head portion, said resilient member bridge portion being in engagement with said shaving unit cam means for exerting said biasing force thereon, said handle comprising a single molded plastic unit.

4,094,064

SHEARING TOOL FOR SYNTHETIC RESIN TUBES

Hideichi Nishikawa, and Masaharu Sakamoto, both of Tsu, Japan, assignors to Matsuzaka Iron Works, Inc., Tsu, Japan

Filed Apr. 14, 1977, Ser. No. 787,577
Claims priority, application Japan, Apr. 16, 1976, 51-48576[U]; Dec. 9, 1976, 51-164945[U]
Int. Cl.[2] B26B *13/00*
U.S. Cl. 30—92 2 Claims



1. In a shearing tool for synthetic resin tubes comprising:
an upper handle portion;
a lower jaw connected to the leading end of said upper handle portion by means of an intermediate neck portion integral with the upper handle portion, said upper handle portion being formed with an opening extending from the forward portion of said handle portion to the leading end of the lower jaw;
a lower handle portion pivoted at the leading end to said lower jaw;
a shearing blade pivoted to said upper handle portion withing said opening, said shearing blade being formed at the rear portion positioned between said upper and lower handle portions with a guide slot, said guide slot including a series of notches along one side edge of the slot and a planer side edge along the opposite or other side edge of the slot;
a rocking bar pivoted at one end to the lower handle portion and including at the other end of the rocking bar a pin freely received in said guide slot for selectively engaging said series of notches formed on the slot, said rocking bar being adapted to urge said shearing blade toward said lower jaw when said upper and lower handle portions are pivoted toward each other by a gripping force applied to the handle portions;
a spring for urging said pin to engage in said series of notches;
a return spring for urging said lower handle portion away from said upper handle portion to the initial position when said gripping force is released from the upper and lower handle portions;
a friction washer provided about said pivot connection of said shearing blade to said upper handle portion within said opening for applying friction force to the side of the blade so as to hold the blade in position; and
a pin provided on said lower handle portion for engaging said rocking bar so as to stop the bar against rocking; characterized in that said pivoting of said shearing blade to said upper handle portion is in an intermediate position of the length of said blade, said planar side edge of the guide slot formed in the blade being disposed in an inclination with respect to the cutting edge of said shearing blade in the counterclockwise direction, said upper and lower handle portions being fabricated from light metal having a U-shaped cross-section, both of said rear portions of said shearing blade and said rocking bar being disposed between two walls of U-shaped cross-section of said handle portions, said lower jaw being formed with an arcuate tube receiving recess on the upper surface of the jaw, and

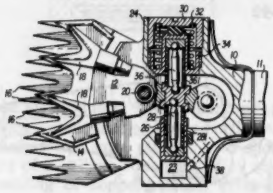
thereby the user being able to shear said tubes by applying gripping force with one hand to the handle portions.

4,094,065

ANIMAL SHEARING DEVICE

William R. C. Geary, 4/18 Kensington Rd., South Yarra, Victoria, Australia (3141)

Filed Dec. 7, 1976, Ser. No. 748,203
Int. Cl.[2] B26B *19/24, 19/34*
U.S. Cl. 30—210 8 Claims



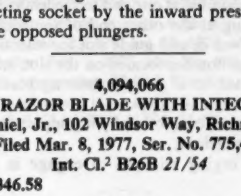
1. A shearing device comprising a body provided with a pivoted arm for oscillating a cutter across the face of a comb fixed to the body, a hydraulic cylinder arranged laterally on the body at one side of the pivoted arm and forwardly of the pivotal axis thereof, a plunger in the cylinder, a connecting rod extending between the plunger and the arm so as to transmit inward movements of the plunger to the arm and thereby displace the latter towards the opposite side of the body, means for attaching a hydraulic supply tube to the body thereby to connect the interior of the cylinder to hydraulic pulse generating apparatus, a second cylinder on the body at the opposite side of the pivoted arm and in coaxial alignment with the firstmentioned cylinder, a plunger in said second cylinder, and a second connecting rod extending between the lastmentioned plunger and the arm thereby to displace the latter towards the firstmentioned side of the body when the secondmentioned plunger is moved inwardly; each connecting rod having a semi-spherical head at each thereof which is seated in a correspondingly shaped socket on the respective plunger or pivoted arm, and the connecting rods are maintained in engagement with the coacting socket by the inward pressures constantly exerted on the opposed plungers.

4,094,066

SURGICAL RAZOR BLADE WITH INTEGRAL GUARD

Donald S. Daniel, Jr., 102 Windsor Way, Richmond, Va. 23221

Filed Mar. 8, 1977, Ser. No. 775,475
Int. Cl.[2] B26B *21/54*
U.S. Cl. 30—346.58 1 Claim



1. A surgical razor blade with an integral guard for its cutting edge in the form of a plurality of spiral windings of thread being of flexible material capable of being pressed against the blade cutting edge under pressure in shaving contact with the normally unshaven areas of the skin without severance of the thread, said thread having a diameter within the range of 0.2 mm to 1.0 mm, said windings extending around the cutting edge of the blade in a uniformly spaced manner and the spacing between adjacent windings being selected from the group consisting of 1.0 to 2.0 mm; 2.0 to 3.0 mm and 3.0 to 4.0 mm, and wherein said blade is sterile and is packaged in such condition for one time use only.

4,094,067

METHOD FOR PRODUCING ARTIFICIAL DENTURE

Mitchell M. Hazar, 3120 N. Rose Cir., Phoenix, Ariz. 85018

Filed Jul. 15, 1976, Ser. No. 705,570
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—2 2 Claims

1. A method for producing a denture comprising: forming a generally U-shaped assembly of prosthetic teeth, bonding said U-shaped assembly of teeth into a generally U-shaped hard base structure; providing a terminus of said hard base structure disposed a short distance rearwardly of the incisor areas of said assembly of prosthetic teeth; mechanically and removeably connecting a soft deflectable formable layer onto said hard U-shaped base by means of resilient plugs projecting from said soft deflectable formable layer and removably received in sockets in said hard U-shaped base; inserting said hard U-shaped base and deflectably formable layer into a patient's mouth and finger forming said deflectable formable layer into close proximity to the edentulous areas of the patient's mouth; then removing said base and deflectably formed layer and placing a hardenable orally curable material in impressionable form on the soft deflectably formed layer; then unitarily reinserting the base and layer and curable material into the human individual's mouth and impression forming the curable impressionable material into impression conformance with said edentulous gum area of the patient's mouth and allowing the curable impressionable material to cure over the deflectably formable layer and bond thereto, to form a liner which conforms intimately to the features of the edentulous gum areas of the mouth, thereby forming a fitted denture module; then making a first impression model of one side of said fitted denture module; then making a second impression model of the opposite side of said fitted denture module; then removing the impressionable material and soft deflectably formed layer from the hard U-shaped base assembly of prosthetic teeth, then casting uncured denture base resin in a formable form between said second impression model and with said first impression model with the U-shaped hard base structure imbedded therein; and allowing said uncured denture base resin to cure in bonded relationship to said hard base structure to form said denture.

4,094,068

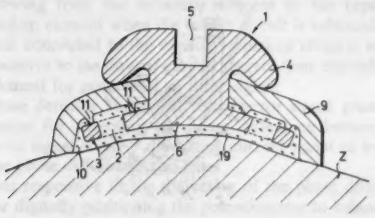
ORTHODONTIC BRACKET ASSEMBLY

Karl Schinhammer, Iserlohn-Letmathe, Germany, assignor to Scheu-Dental Inh. Rudolf Scheu Herstellung & Vertrieb Von Dentalbedarf, Letmathe, Germany

Filed Jul. 16, 1976, Ser. No. 705,898
Claims priority, application Germany, Aug. 1, 1975, 2534368
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 A 11 Claims

1. An orthodontic assembly including an orthodontic bracket which is particularly adapted for use by being first mounted with a transfer matrix upon a positive model of a tooth which is to have said bracket ultimately applied thereto after removal of said bracket from said positive model, said assembly comprising a bracket base defining on said orthodon-

tic bracket a surface for fastening said bracket upon a tooth, bracket wings extending laterally from said base of said bracket and defining therebetween a slot adapted to receive therein a regulating arch, a self-adhesive strip removably adhered on one side thereof to said fastening surface of said bracket base and adapted to have its opposite side removably adhered to a model tooth, and a protective foil extending between said



bracket wings and said bracket base and also extending to said adhesive strip in surrounding relationship with said bracket base, said protective foil being arranged to prevent penetration of the material forming said transfer matrix to the space between said bracket base and said bracket wings when said bracket is being mounted upon said positive tooth model with said transfer matrix.

4,094,069

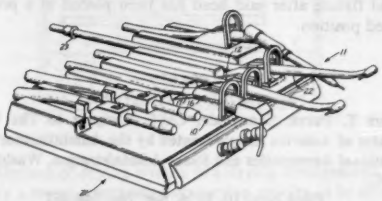
DENTAL INSTRUMENT RETRACTION DEVICE

Raymond Cope, 3541 Springsvally Rd., Birmingham, Ala. 35223

Filed Feb. 10, 1977, Ser. No. 767,498

Int. Cl.[2] A61C *1/14*

U.S. Cl. 32—22 **3 Claims**



1. A dental instrument retraction device comprising in combination: an elongated tubular recess structure forming a seat for alternately holding a body of an instrument and a tube anchored to a rearward portion of an instrument and the recess structure including bottom wall structure and side wall structures extending upwardly therefrom, and there being formed forward and rearward ports adjacent the seat and an open structure-free space above each of the seat and the forward and rearward ports, and there being formed an inwardly-directed retaining abutment substantially at said rearward port positioned and of a size such that a structure of a predetermined size larger than a cross-section of said tube anchored to a rearward portion of an instrument is prevented from further rearward retraction thereby providing for limiting rearward retraction of the anchored tube, and there being formed an inwardly-directed overhang from at least one of said side wall structures substantially above said seat and said forward and rearward ports, the inwardly-directed overhang being of a predetermined dimension sufficiently great to prevent dropping into said seat a structure of said predetermined size larger than said cross-section of said tube anchored to said rearward portion of said instrument and said overhang being limited to a maximum dimension such that the tube having said cross-section is enabled to drop into each of said seat and said forward and rearward ports, and said forward port being of a predetermined width at least as large as a width of said structure having said predetermined size such that the object is retractable rearwardly into the forward port beneath said overhang into said seat and held retainably against said retaining abutment; and a through-passage structure having at least one side support wall and an arch barrier-structure extending laterally from the side support wall, the barrier-structure extending above a through-space aligned with and in juxtaposition to said forward port, the barrier-structure being at a height above said overhang sufficient for travel of said tube of said cross-section substantially along an upper face of said overhang, and said through-space of said barrier-structure being of a width at least as large as said predetermined size, and the through-passage structure being mounted in fixed relationship relative to said recess structure; and said tube adapted to have a dental instrument operatively attached to a forward end thereof, the tube being of a tube cross-section sufficient for travel to and fro through each of said forward and rearward ports and downwardly past the overhang into said seat; and retainer structure mounted on said tube and being adapted for positioning at different alternate positions axially along said tube; the retainer structure having a width cross-section of said predetermined size larger than the cross-section of the tube such that when the tube is advanced axially forwardly the retainer structure rides on top of said overhang to a location forward thereof, and when thereafter the tube is retracted axially rearwardly the retainer structure may be directed upwardly by flipping the tube upwardly above said overhang, and alternately when the tube is not flipped during retraction thereof, the retainer structure is drawn through said forward port into said seat against said retaining abutment.

4,094,070

MICROMETER HEAD WITH DOUBLE COUNTER

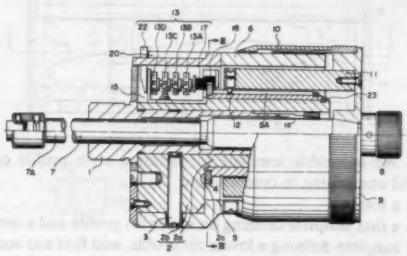
Tetsunori Tanada, Kure, Japan, assignor to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,649

Claims priority, application Japan, Sep. 23, 1975, 50-130623[U]

Int. Cl.[2] G01B *5/00*

U.S. Cl. 33—166 **2 Claims**



1. A micrometer head comprising:

a tubular body including a central sleeve fixed to the body and having an axial opening with female threads,

a spindle having male threads engaging said female threads of the body, said spindle being movable axially of the body upon rotation of the spindle,

said tubular body having a generally cylindrical exterior and defining chamber means between said spindle and said exterior,

said spindle further comprising a circular end, and a tubular member secured to said end and extending axially into said body, said tubular member extending around said central sleeve,

a gear within said body, and adjacent said chamber means,

means restraining said gear from axial movement with respect to said body,

a collar mounted for rotation with respect to said central sleeve and between said sleeve and said tubular member of the spindle, said gear being fixed to said collar for rotation

with the collar, and drive means connecting said tubular member to said collar for rotating said collar in response to rotation of the tubular member and spindle, while permitting axial displacement of the spindle and tubular member with respect to the body,

a first digital counter mounted in said chamber means to indicate the displacement of said spindle in a first direction relative to said body, said first counter having a zero-reset mechanism,

a second digital counter mounted in said chamber means on the same side of the axis of the body as said first counter, to indicate the displacement of said spindle in a second direction relative to said body, said second counter having a zero-reset mechanism,

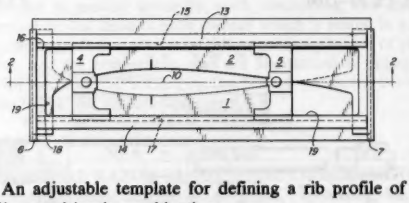
gear means connecting said first counter to said gear for operating the first counter to indicate axial displacement of said spindle in a first direction with respect to said body, and

second gear means connecting said second counter to said gear for operating the second counter to indicate axial displacement of said spindle in a second direction with respect to said body.

4,094,071
ADJUSTABLE TEMPLATE FOR TAPERED AIRFOIL RIB PROFILES

James J. Denaro, 543 Bedford St., Concord, Mass. 01742

Filed Nov. 11, 1976, Ser. No. 740,869
Int. Cl.[2] B41K 1/32; G01B 3/14
U.S. Cl. 33—174 B 9 Claims



1. An adjustable template for defining a rib profile of an airfoil comprising in combination:

a. a frame;

b. a first template defining an upper rib profile and a second template defining a lower rib profile, said first and second templates being slideably engaged within said frame so that each is independently slideable in a direction transverse to the chord of said rib to thereby define the rib profile; and,

c. means for defining an edge of said rib profile, said means comprising a slide assembly engaged within the frame and slideable along the chord of said rib profile.

9. An adjustable template for defining rib profiles of a tapered airfoil, comprising:

a. a first template defining an upper rib profile;

b. a second template defining a lower rib profile;

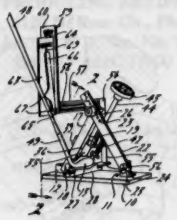
c. means for holding said first template and said second template in juxtaposition to each other to define a rib profile, said means for holding comprising a hinged connection allowing the first template to pivot with respect to the second template; and,

d. means for defining a trailing edge for said rib profile, said means comprising a slide member slidable along at least one of said templates in a direction generally parallel to the chord of said rib profile.

4,094,072
GOLF CLUB FIXTURE

C J Erb, 22621 Beech, Dearborn, Mich. 48124

Filed Feb. 11, 1977, Ser. No. 767,804
Int. Cl.[2] G01B 5/24
U.S. Cl. 33—174 F 15 Claims

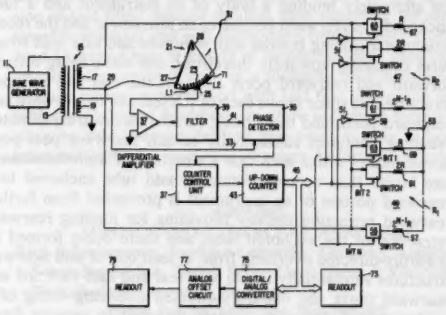


1. In a fixture for use with a typical golf club known as an iron having a head connected to a hosel interfitting coaxially with the lower end of a shaft, the head comprising a plane forward face having a plurality of parallel horizontal score lines thereon and terminating outwardly at a toe spacing a bottom sole and a top edge, the combination of a guide having an indexing surface defining a plane for receiving said head to position said forward face in a predetermined angular alignment with respect to said fixture with said face flush with said surface, horizontal indexing means for providing a reference line capable of visual alignment with a parallel portion of one of said horizontal score lines to enable the positioning of the score lines of said head in alignment with said reference line, and clamping means for clamping said head in a fixed position in said fixture after said head has been placed in a properly aligned position.

4,094,073
ANGLE DETECTOR

Gilbert T. Parra, Sunnyvale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,457
Int. Cl.[2] G01C 9/06
U.S. Cl. 33—366 9 Claims



1. An angle detector comprising:

a capacitive pickup member;

an inductive element suspended as a pendulum and angularly movable past the capacitive pickup element, the inductive element divisable into two parts L_1 and L_2 formed between the electrical center of the capacitive pickup element and the two ends of the inductive element in accordance with

the angular displacement of the inductive element with respect to the capacitive pickup element;

a digitally positionable potentiometer electrically shunting the inductive element to form the remaining two parts R_1 and R_2 of a bridge circuit;

an alternating current source connected to the bridge circuit to provide an alternating current signal therein, no current flowing from the inductive element to the capacitive pickup element when the bridge circuit is balanced;

means connected to the capacitive pickup element and responsive to the flow of current thereto from the inductive element for generating an error signal;

a phase detector connected to the error signal generating means for detecting the phase difference between the error signal and the alternating current signal to indicate the phase difference; and

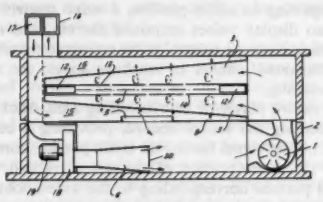
means responsive to the indicating of the phase difference for digitally positioning the potentiometer to balance the bridge circuit and null the error signal.

4,094,074

METHOD AND ARRANGEMENT FOR DRYING ARTICLES

Alfons Schrader; Waldemar Schreiner, and Anton Gessner, all of Remscheid-Lennep, Germany, assignors to Buttner-Schilde-Haas AG, Krefeld-Uerdingen, Germany

Filed Oct. 4, 1976, Ser. No. 729,144
Claims priority, application Germany, Oct. 4, 1975, 2544589
Int. Cl.[2] F26B *3/00*
U.S. Cl. 34—33 **10 Claims**



10. Method of drying articles in a drying arrangement, particularly a tenter, comprising conveying articles to be dried in a path through the drying arrangement; heating air in the drying arrangement to a temperature of approximately 250° C; directing the heated air into contact with the articles to be dried by circulating air with cross-flow blower means in direction transversely of the path at a velocity of 40 m/sec and at a pressure of 100 mm water column measured at 20° C.

4,094,075

SYSTEMS FOR DRYING PARTICULATE MATERIAL

Peter M. Caruso, 558 Cherry St., Galesburg, Ill. 61401

Filed Mar. 21, 1977, Ser. No. 779,868
Int. Cl.[2] F26B *21/06*
U.S. Cl. 34—72 **10 Claims**

1. A system for drying moisture-entrained particulate material, comprising:

means defining a pressurizable chamber for receiving the material to be dried, said chamber having an inlet and an outlet;

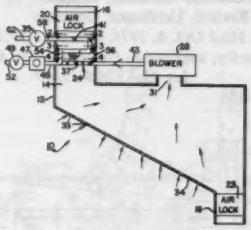
inlet means for enabling the material to be dried to flow into said chamber via said inlet;

outlet means for enabling the dryed material to flow out of said chamber via said outlet;

fluid means disposed within said chamber for dispersing the material within said chamber between said inlet and said outlet;

heat exchanging means for heating the material to be dried flowing into said chamber;

compressing means for drawing air through said chamber to remove moisture from the material and for compressing the moisture-entrained air for heating it; and



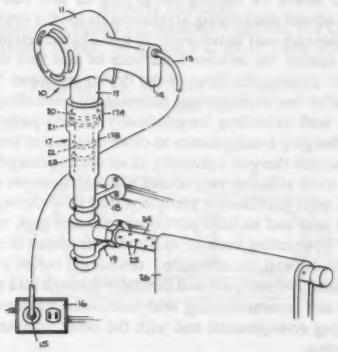
means for guiding the flow of heated moisture-entrained air from said compressing means to said heat exchanging means to supply heat to it.

4,094,076

FIXTURE FOR PORTABLE HAIR DRYER

Floyd M. Baslow, 100 Lafayette St., New Bethlehem, Pa. 16242

Filed Nov. 19, 1976, Ser. No. 743,469
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—90 **9 Claims**



1. A fixture adapted to cooperate with an electrically-operated portable hair dryer having a tubular nozzle from which a stream of hot air is emitted, said fixture serving as a storage holster for the hair dryer when it is not in use and as a fabric dryer for which the hair dryer supplies the necessary hot air, said fixture comprising:

A an upright holster section supported in an upright position against a wall and constituted by a rigid tube whose upper end is formed into an open socket for nesting the nozzle of the hair dryer in a manner causing substantially all of the hot air stream emitted from the nozzle to be projected into the tube, said holster holding said portable hair dryer in readiness for immediate withdrawal for drying hair, and

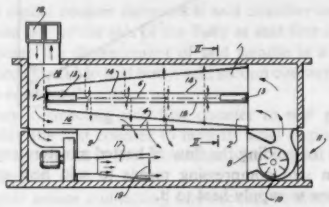
B a hollow rack section attached to said holster section and communicating with the tube for supporting a fabric article to be dried, said rack section having perforations therein whereby when the hair dryer in the holster section is activated, the resultant stream of hot air is conducted by the holster section to the rack section and emitted through said perforations to provide hot air jets to dry the article.

4,094,077

DRYER ARRANGEMENT

Alfons Schrader; Waldemar Schreiner, and Anton Gessner, all of Remscheid-Lennep, Germany, assignors to Buttner-Schilde-Haas AG, Krefeld, Uerdingen, Germany

Filed Oct. 4, 1976, Ser. No. 729,143
Claims priority, application Germany, Oct. 4, 1975, 2544590
Int. Cl.[2] F26B *13/00*
U.S. Cl. 34—155 7 Claims



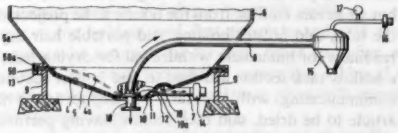
1. An apparatus for drying articles, particularly a tenter, comprising a housing having an interior; means subdividing said interior into two compartments, including a partitioning wall; means for conveying articles to be dried in an elongated path through one of said compartments; means for directing a plurality of streams of drying air against the articles, including a pair of discharging arrangements juxtaposed with one another across said path so as to bound a gap extending along said path from two opposite sides thereof and each including a plurality of channel elements successively arranged at a predetermined spacing from one another along, and each extending transversely of, said path, and having outlet ports facing said path, and means for feeding the drying air into said channel elements of said discharging arrangements for the drying air to emerge through said outlet ports of said channel elements and impinge against the articles from both of said two sides; and means for guiding the flow of the drying air away from the articles after the impingement thereagainst, including at least one side wall extending longitudinally of said path between said discharging arrangements to close said gap at least at one transverse side thereof, a plurality of air outlet passages formed between each adjacent two of said channel elements and each having a main portion of a predetermined flow-through cross-sectional area and an inlet port open into said gap, means for partially obstructing each of said outlet passages at said inlet port thereof, and an elongated discharge outlet extending longitudinally of said path and centrally through said partitioning wall and communicating with said outlet passages of said discharging arrangements and with the other compartment of said housing.

4,094,078

PARTICLE FEEDING AND TREATING SYSTEM

Adolf Lesk, and Wolfgang Hageleit, both of Osterburken, Germany, assignors to Ingenieur-Boero, Osterburken, Germany

Filed Mar. 17, 1976, Ser. No. 667,822
Claims priority, application Germany, Mar. 19, 1975, 2511996
Int. Cl.[2] F26B *21/06*
U.S. Cl. 34—181 13 Claims



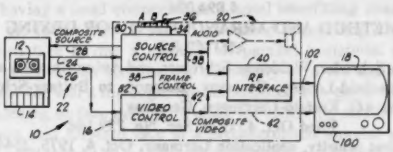
1. A feeding apparatus comprising, in combination:
a vessel having a floor;
means for withdrawing fluent particulate material from said vessel adjacent said floor;
a flexible support lining in said vessel on said floor defining therewith a generally closed variable-volume space and constituted as a gas-impervious foil formed with a multiplicity of throughgoing holes and a gas-pervious textile sheet bonded to said foil over said holes; and
blower means for injecting a gas into said space and thereby flexing said lining, whereby said material is loosened by said gas passing through said holes in the foil and disseminating through said sheet.

4,094,079

SINGLE MEDIUM AUDIO-VISUAL TEACHING MACHINE

Loyd G. Dorsett, Norman, Okla., assignor to Dorsett Educational Systems, Inc., Norman, Okla.

Filed Apr. 5, 1977, Ser. No. 784,737
Int. Cl.[2] G09B *5/06*
U.S. Cl. 35—8 A 8 Claims



1. In an audio-visual teaching machine for use with a source record comprising an audio portion, a video control portion having video display pulses entrained therein, and a source control portion having a control pulse entrained therein in one of a predetermined number of response states, the teaching machine including:
a source record playback unit including a playback portion for receiving the source record, providing a composite source output signal having an audio portion corresponding to the audio portion of the source record, a video control portion corresponding to the video control portion of the source record, and a source control portion corresponding to the source control portion of the source record; and a pause control portion for interrupting the operation of the playback portion thereof in response to a pause signal applied thereto;
an audio output unit for providing an audible output signal in response to an audio signal applied thereto; and,
a video display unit for providing a visual output signal in response to a composite video signal applied thereto;
the improvement comprising:
a source control unit means connected to the source record playback unit, the source control unit means including a response control portion having a plurality of actuatable response input elements, each response input element providing a response input signal in a predetermined one of the response states in response to the actuation thereof, the source control unit means for receiving the source control portion of the composite source output signal, detecting the control pulse entrained in the source control portion, initiating production of the pause control signal for application to the pause control portion of the source record playback unit in response to detecting a control pulse having one of a selected plurality of the response states, receiving each of the response input signals provided by the response input elements upon actuation thereof, comparing the response state of the detected control pulse and the response state of the received response input signal, and terminating production of the pause signal when the response state of the detected control pulse is equal to the response state of the received response input signal;
a video control unit connected to the source record play-

back unit and to the video display unit, the video control unit comprising:

an asyncronous interface circuit means connected to the source record playback unit, the asynchronous interface circuit means for receiving the video control portion of the composite source output signal, detecting the video display pulses entrained in the video control portion, providing an input data signal having input data pulses entrained therein corresponding to the detected video display pulses, and providing an input clock signal having an input clock pulse entrained therein in response to detecting a predetermined number of the video display pulses;

a timer circuit means for providing an output clock signal having output clock pulses entrained therein at a predetermined output clock rate, providing an end-of-scan-line signal having end-of-scan-line pulses entrained therein at a predetermined end-of-scan-line rate, and providing an end-of-field signal having end-of-field pulses entrained therein at a predetermined end-of-field rate;

a memory control circuit means connected to the asynchronous interface circuit means and to the timer circuit means, the memory control circuit means for receiving the input data signal, the input clock signal and the output clock signal, storing each input data pulse entrained in the received input data signal at a predetermined storage location in response to receiving each input clock pulse entrained in the input clock signal, and providing a video output signal having a video data pulse entrained therein corresponding to the input data pulse stored at a predetermined storage location in response to each output clock pulse entrained in the output clock signal;

a video processing circuit means connected to the memory control circuit means, to the timer circuit means, and to the video display unit, the video processing circuit means for receiving the video output signals, the end-of-scan-line signal, and the end-of-field signal, producing a horizontal sync pulse in response to receiving each end-of-scan-line pulse entrained in the end-of-scan-line signal, producing a vertical synch pulse in response to receiving each end-of-field pulse entrained in the end-of-field signal, and adding the horizontal and vertical sync pulses to the received video output signal for application to the video display unit as the composite video signal; and,

means connected to the source record playback unit and to the audio output unit for receiving the audio portion of the composite source output signal and applying the received audio portion to the audio output unit as the audio signal.

4,094,080

BOOT OR SHOE HEATING DEVICE

James J. Sanders, 9409 S. Hillcrest Dr., Oklahoma City, Okla. 73159

Filed May 2, 1977, Ser. No. 793,095
Int. Cl.[2] A43B *7/02;* **A41D** *17/00;* **A61F** *7/06*
U.S. Cl. 36—2.6 **1 Claim**

1. A footwear heating device, comprising:

a superposed pair of elongated fabric sheet material sections adapted to overlie and be secured, in a partial wraparound fashion, to the toe and vamp areas of a shoe or boot, said sections being stitched together to form a plurality of pockets;

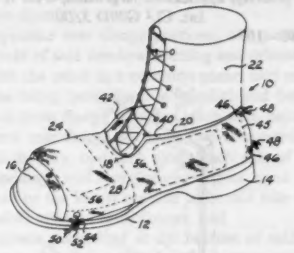
a like plurality of flameless heaters disposed within said pockets;

a plurality of eyelets secured to the respective stitched together end portions of said sections;

a plurality of flexible strands extending through and joining oppositely disposed cooperating pairs of said eyelets in one said end portion;

a toe clip comprising a U-shaped rod adapted to extend transversely across the depending surface of the toe portion of a shoe or boot,

said toe clip having arcuately curved legs forming a pair of closed loops; and,



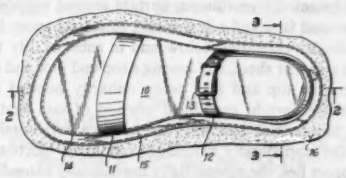
other flexible strands joining said closed loops to cooperating eyelets in the other said end portion.

4,094,081

BEACH SANDAL

Joseph Reiner, 30 Sutton Pl.; Kenneth Vigluicci, 103 Crest Rd., and Michael Reiner, 30 Sutton Pl., all of Toms River, N.J. 08753

Filed Apr. 11, 1977, Ser. No. 786,745
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—116 **1 Claim**



1. A beach shoe for walking on sand surfaces, comprising:

a non-pivotable, flat sole surface in the general shape of the user's foot;

a continuous wall projecting substantially perpendicular to the sole surface and integrally-formed therewith and extending about and adjacent to the periphery of said surface, said wall terminating in a flat rim for contact with the sand and defining an unobstructed cavity in the bottom surface of the sole extending from the toe to the heel section of said sole, said peripheral wall being tapered from its widest portion adjacent to said sole surface, to its narrowest portion in contact with the sand surface, the depth of said cavity, defined by said projecting wall surface, being sufficient to prevent the bottom of said sole surface from contracting; and

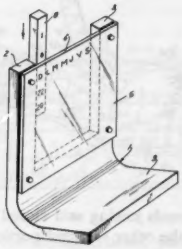
means on the top of the sole surface for securing the sole to the user's foot, said means including a foot pad secured to the top of said sole surface, a first strap coupled to said foot pad for engagement over the toes of the user, and a second strap having a buckle-and-belt arrangement for securement over the user's ankle.

4,094,082

PERPETUAL CALENDAR

Pedro Nicolas Cannarozzo, Tinogasta 3174, Buenos Aires, Argentina

Filed Sep. 30, 1976, Ser. No. 728,400
Claims priority, application Argentina, Oct. 7, 1975, 260713
Int. Cl.[2] G09D *3/00*
U.S. Cl. 40—107 3 Claims



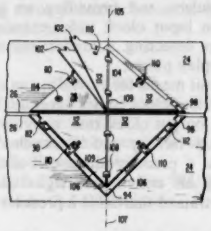
1. A perpetual calendar, comprising in combination, a frame defining an enclosure which is open at its top, and including two substantially upright, spaced and elongated prisms facing each other and each having a rear surface, a front surface and a bottom surface; a substantially upright rear sheet spanning said spaced prisms and being connected to the rear surfaces of said prisms; an at least partially transparent, substantially upright front sheet spanning said spaced prisms in such a manner that said front sheet is spaced a substantially constant distance from said rear sheet and being connected to the front surfaces of said prisms; a J-shaped unitary curviform first support having a substantially constant horizontal breadth and including a curved portion intermediate a substantially horizontally extending rectilinear portion and a substantially upright rectilinear portion having a free horizontally directed end face, the free end face being unitarily bonded to the bottom surfaces of said spaced prisms and extending from one prism to the other; and a substantially rectilinear, upright second support having an upper end face and a lower end face, said second support longitudinally extending below and in substantially the same plane as said rear sheet, and having a top end face and a bottom end face, the top end face being unitarily bonded with the substantially upright rectilinear portion of said first support and the bottom end face being located in a horizontal plane in which the horizontally extending rectilinear portion of said first support lies, the substantially horizontally extending rectilinear portion of said first support having an elongated substantially horizontally extending upper surface, whereby writing instruments and the like can be supported in a horizontal position on this upper surface, said front sheet being rectangular, and the curved portion of said curviform first support curves outwardly relative to said front sheet and away from the horizontally extending rectilinear portion; and further comprising seven elongated prismatic bodies removably mounted within the enclosure defined by said frame and provided with indicia representing the days of the month, each prismatic body is a column having a length equal to the vertical distance between the free end face of the substantially upright rectilinear portion of said first support and the top of said front sheet, said front sheet being provided with indicia representing the days of the week, the indicia being located in such a manner that each of them are above the indicia represented on each of said prismatic bodies, said seven prismatic bodies completely filling the enclosure defined by said frame, and each of said prismatic bodies having lateral sides equal to the lateral sides of said prisms, said rear sheet having an upright length which is less than the upright length of said front sheet, so as to facilitate removal of said prismatic bodies.

4,094,083

VEHICLE PLACARDING APPARATUS

Harry Fund, Chicago, Ill., assignor to Modular Products, Chicago, Ill.

Division of Ser. No. 714,840, Aug. 16, 1976, Pat. No. 4,058,918.
This application Jul. 20, 1977, Ser. No. 817,429
Int. Cl.[2] G09F *21/04*
U.S. Cl. 40—536 5 Claims



1. An apparatus for providing changeable placarding for a roll-up vehicle door formed of a plurality of articulated, rigid rectangular door sections, consecutively hinged along horizontal axes, comprising:

a first base member for attachment to a first rectangular door section;

a second base member for attachment to a second rectangular door section adjacent the first rectangular door section;

a first plurality of generally congruent, right triangular plates;

first mounting means for pivotally attaching each of the first plurality of plates to the first base member, so that the plates are pivotable about a common axis approximately parallel with parallel congruent edges of each of the plates;

a second plurality of generally congruent, right triangular plates;

second mounting means for pivotally attaching each of the second plurality of plates to the second base member, so that the plates are pivotable about a common axis approximately parallel with parallel congruent edges of each of the plates; and

manually operable means on said first and second base members for clipping the triangular plates to their respective base members to retain the plates in a plane approximately parallel to the plane of the door sections to which the respective base members are attached;

said triangular plates having indicia and being located such that surfaces of four triangular plates facing outwardly simultaneously are adapted to collectively define a diamond-shaped area bearing an inscription, split at the horizontal axis along which the first and second door sections are hinged and split at the common pivoting axes.

4,094,084

CURVED PRISM ORNAMENT

Fred Allen DaMert, P.O. Box 36, Oakland, Calif. 94604

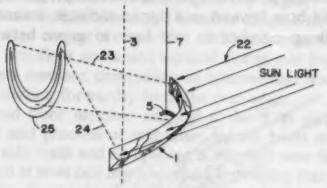
Filed May 3, 1976, Ser. No. 682,886
Int. Cl.[2] G09F *19/02*
U.S. Cl. 40—613 7 Claims

1. An optical ornament comprising:

an elongate arcuate transparent member shaped like a prism which has been curved about an exterior axis perpendicular to its length; and

suspension means located midway between the ends of said member so that said member may be pivotally suspended

in a horizontal attitude, said suspension means comprising a finger extending from a radially inner surface of said



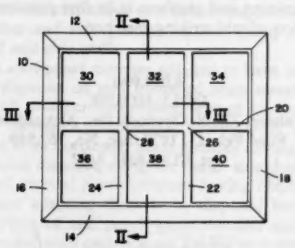
member; and, whereby said member may rotate freely in response to air currents.

4,094,085

PICTURE FRAME APPARATUS

Ronald M. Nolan, Jr., 5739 Roanwood Way, Concord, Calif. 94521

Filed Aug. 2, 1976, Ser. No. 710,782
Int. Cl.² G09F 1/12
U.S. Cl. 40—152.1 6 Claims



1. A picture frame apparatus for displaying a plurality of baseball cards, photographs, or the like, comprising:

a frame portion including a top edge strut having a top edge flange formed thereon, a bottom edge strut, and first and second side edge struts wherein said edge struts are defined such that said frame portion extends away from a wall or other structure at a fixed angle when said frame portion is affixed thereto, as a function of the distance from the outer perimeter of said frame portion, with the outer perimeter of each edge strut coming in contact with said wall or other structure, said top edge flange formed such that one surface thereof will lie flush against said wall or other structure when the outer perimeter of said edge strut abuts thereto;

hanger means including mounting plate means, means for affixing said mounting plate to said wall or other structure, hook means attached to said mounting plate means, said hook means defined in a shape such that said top edge flange will mate therewith to thereby removably affix said frame portion and associated strut means to said hook means, wherein said hook means comprises a plurality of hooks each said hook including two surfaces which engage to define an angle therebetween which is substantially identical to the angle existing between said top edge flange and the body of said top edge strut such that said top edge flange and strut will mate securely with each hook; and

strut means comprising at least one strut interconnecting two of said edge struts such that a plurality of window openings are defined within said frame portion thereby;

said struts including elongated slot defining means positioned adjacent each said window opening such that a card, photograph, or the like may be seated therein to thereby position the card or the like in said opening, said elongated slot defining means comprising:

i. two opposite front flange portions, one positioned on either side of said window opening and oriented to face one with the other in a common plane, said front flange portions defining thereby left and right edges of said window opening;

ii. two opposite rear flange portions, one positioned on either side of said window opening and oriented to face one with the other in a common plane, said rear flange portions being positioned in parallel and behind said opposite front flange portions, such that, between said front and rear flange portions, two elongated slots are defined thereby, one each along each side of said window openings said rear flange portions sized such that said card or the like is enabled to be slid into said elongated slots without impediment; and

iii. base means positioned at the bottom of said window opening and defining thereby the bottom edge of said window opening, said base means acting to stop the card or the like from exiting through the bottom of said elongated slots.

4,094,086

ADJUSTING DEVICE FOR DOUBLE-BARRELLED GUNS

Georges A. Gevers, Liege, Belgium, assignor to Fabrique Nationale Herstal S.A. en abrege FN, Herstal, Belgium

Filed Nov. 15, 1976, Ser. No. 741,987
Claims priority, application Belgium, Jan. 22, 1976, 254770
Int. Cl.² F41C 21/06
U.S. Cl. 42—1 R 6 Claims

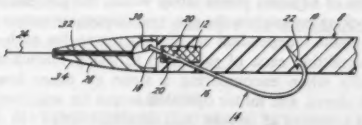
1. Adjusting device for double-barrelled guns, comprising two elements provided with accessory parts located between the barrels, one of these parts forming an axially extending incline for the other which acts as a wedge, one at least of aforesaid elements being movable axially with respect to the other.

4,094,087

FISHING LURE AND HOOK

Jerry W. Carpenter, 713 Western Ave., Orange, Tex. 77630

Filed Feb. 4, 1977, Ser. No. 765,571
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.24 4 Claims



1. The combination of a fishing lure and a fishing hook,

the fishing hook comprising:

an eye for attachment to a fishing line,

a shank,

a hook, and

at least one barb on the shank adjacent and extending toward the eye,

the fishing lure comprising:

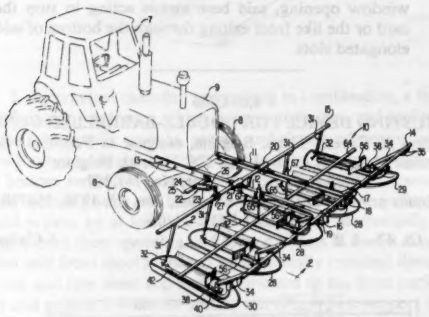
a lure body of flexible, plastic material inert to water simulating bait and having action in the water, and

a fibrous material embedded within the leading end of the lure body; and

the shank of the fishing hook extending through the leading end of the lure body,
the barb disposed within the fibrous material, and
the hook hooked into the plastic material of the lure body downstream from the fibrous material,
whereby, the lure body is restrained by the barb within the fibrous material from movement away from the eye and down the shank of the fishing hook as the fishing lure and hook are pulled through the water by the fishing line.

4,094,088
MOBILE INSECT COLLECTING AND DESTROYING APPARATUS

Robert C. Harrell, 616 N. St. John, Dyersburg, Tenn. 38024
Filed Nov. 15, 1976, Ser. No. 741,694
Int. Cl.[2] A01M *1/20*
U.S. Cl. 43—144 **14 Claims**

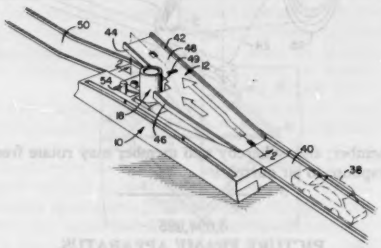


1. Tractor mountable apparatus for collecting and destroying insects from multiple rows of growing plants comprising a supporting frame including a pair of transversely spaced longitudinal support members mountable upon the front end of a tractor to project forward thereof, and a pair of front and rear longitudinally spaced transverse pan support and vine agitator members carried by the longitudinal support members, a plurality of open top elongated metal pans directly below the front transverse pan support and vine agitator member to receive bugs therefrom, suspension means for suspending said metal pans from said pair of transverse support members at spaced intervals so that said pans move adjacent the ground between the rows of plants as the apparatus moves along the plant rows, burner means in each of said metal pans for heating said pans and for burning insects falling into said pans, each of said pans having also separate vine agitator means mounted above and transversely across the pan for agitating the side branches of adjacent plants along which the pan moves, and for knocking insects into the pan, said suspension means including yieldable independent suspension means for each of said pans permitting each of said pans to swing rearwardly and upwardly when encountering a stone or other low lying ground object, and motor operated means for selectively raising and lowering all of said pans simultaneously.

4,094,089
JUMPING RAIL

Hiroshi Sano, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Jan. 4, 1977, Ser. No. 756,701
Claims priority, application Japan, Apr. 22, 1976, 51/50387[U]
Int. Cl.[2] A63H *18/16*
U.S. Cl. 46—1 K **10 Claims**

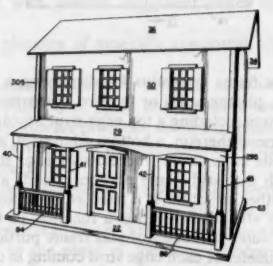
1. A jumping rail, comprising a base having an upper surface, a platform having an upper surface, means mounting said platform to said base to move between a first position wherein said platform upper surface is aligned with said base upper surface and a second position wherein one end of said platform is raised upwardly from said base, means urging said platform to said second position, a striking member projecting upwardly from said base beyond said upper surfaces, means mounting said striking member to said base to move between a first



position wherein said striking member engages said platform retaining said platform in its first position and a second position wherein said striking member is disengaged from said platform permitting said platform to move to its second position, means urging said striking member to its first position, and releasable means maintaining said platform in its first position regardless of the position of said striking member.

4,094,090
DOLL HOUSE

Harry E. Walmer, 721 N. Overlook Dr., Alexandria, Va. 22305
Filed Feb. 11, 1977, Ser. No. 767,959
Int. Cl.[2] A63H *3/52*
U.S. Cl. 46—19 **8 Claims**



1. An easily assembled knock-down doll house having a front porch construction with columns, the parts of which are fitted together and held together only with pegs comprising:
a. a generally rectangular first floor member comprising left, right and front grooves in the top surface thereof, at least one intermediate groove in said surface parallel to said left and right grooves, and a series of in-line holes disposed forward of said front groove;
b. a front wall member having a size and shape to have its bottom edge engage said front grooves of said first floor member, comprising vertical L-shaped side beams, a top horizontal beam member disposed on the inner front wall containing at least one vertical slot, and a horizontal L-shaped beam member disposed on the outer side at an intermediate position;
c. left and right side walls, having respective sizes and shapes to have their front edges engage said L-shaped beams of said front wall and their bottom edges engage said respective left and right grooves of said first floor, each of said side walls containing a top, inner horizontal beam member having an inward side groove, an inner second horizontal

beam member having an inward side groove and disposed between said side wall top beam and the lower edge of said side wall, inwardly angled top edges, and a slot disposed at the terminus of said angled top edges;

d. at least one intermediate wall member adapted to have its lower edge engage a respective said intermediate groove in said first floor and a said vertical slot of said front wall top beam member, comprising an intermediate horizontal slot extending forwardly from the rear edge;

e. a second floor member adapted to have its side edges engage said grooves of said inner second beam members of said side walls and comprising a stairwell near the front edge and at least one horizontal slot extending rearwardly from the front edge, said slot adapted to engage said horizontal slot of said intermediate wall member;

f. a third floor member adapted to have its side edges engage said grooves of said inner top beam members of said side walls, and comprising a beam member disposed along the rear edge having at least one slot disposed on the underside thereof adapted to engage the top edge of a said intermediate wall member;

g. front and rear roof panels each comprising a horizontal beam member disposed along the underportion of one edge containing a slot near each end, said panels being constructed and arranged to adapt said roof beams to enter said terminus slots of said side walls and to adapt the slots of said beams to receive the edge of said terminus slots with said respective roof beams disposed adjacent to each other and said panels disposed along said angled edges of said side walls;

h. a porch roof panel member adapted to have its rear portion be disposed on said L-shaped beam member of said front wall member comprising, a rear horizontal beam member having a longitudinal downwardly protruding lip, and a front horizontal beam member having a series of in-line holes disposed along the under side thereof;

i. a series of vertical porch columns having respective sizes and shapes adapting them to be disposed between said front portion of said porch panel member and said first floor member with each column having its bottom portion disposed in one of said first floor series of holes and its top portion disposed in one of said porch front beam member series of holes;

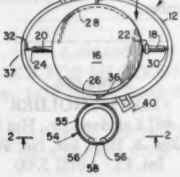
j. a plurality of pegs adapted to be inserted in holes contained in said beams, grooves, wall and floor members at their junctures with each other for retaining said assembled structure together.

4,094,091

INTEGRALLY FORMED PLASTIC SPINNER TOY UNIT WITH MEANS FOR ATTACHING SAME TO A SUPPORT

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to R B Toy Development Co., Skokie, Ill.

Filed Feb. 17, 1977, Ser. No. 769,704
Int. Cl.[2] A63H *33/40*
U.S. Cl. 46—53 **11 Claims**



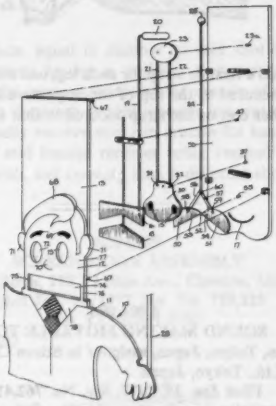
1. A one piece molded plastic unit, comprising a frame member, a spinner positioned within said frame member and spaced therefrom, a pair of journal pins extending outwardly of said spinner, means connecting said spinner to said frame member for ready removal therefrom, said frame member including means for supporting said journal pins, and attachment means connected to said frame for attaching same to a support, said attachment means extending exteriorly of said frame member and molded integrally therewith, whereby detachment of said spinner from said frame member followed by mounting of said journal pins in said supporting means rotatably mounting said spinner in said frame.

4,094,092

TWO DIMENSIONAL ANIMATED CHARACTER

Morey Bunin, New York, N.Y., assignor to Aniforms, Inc., New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,013
Int. Cl.[2] A63H *7/00*
U.S. Cl. 46—126 **9 Claims**



6. An animated puppet, comprising:

means for supporting a plurality of facial features of said puppet;

a mouth background means having a mouth feature thereon;

said puppet including a portion through which said mouth feature may be viewed from the front of said puppet.

means for varying the display of said mouth feature, said varying means including a pair of plates mounted in front of said mouth background means at a location which covers the field of view of at least a portion of said mouth feature;

control means connected to said plates for moving said plates between a first position which exposes the full mouth feature and a second position which covers the sides of said mouth feature to expose only a small central portion thereof;

whereby the movement of said plates provide the simulation of a broad smile of said puppet.

4,094,093

DOLL HAVING SELF-SUPPORTING SITTING AND STANDING POSITIONS

Bette M. Kaelin, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Aug. 18, 1976, Ser. No. 715,526
Int. Cl.[2] A63H *3/02*
U.S. Cl. 46—160 **4 Claims**

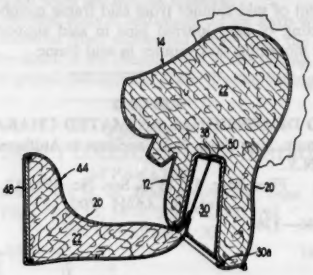
1. A doll, comprising:

a torso portion;

a pair of legs; and

means for securing the legs to the torso for movement between a self-supporting standing position and a self-supporting sitting position, said means comprising a receiver mounted within the torso of the doll for accepting and concealing a substantial length of the legs to permit the

doll to be supported by said legs in a standing position while permitting movement of said legs outwardly relative to said receiver to support the doll in a sitting posi-



tion, and a flexible strap for each leg, one end of each strap being secured to the top of the respective leg and having the other end of the strap secured within the receiver.

4,094,094

SOUND MAKING MOVABLE TOY

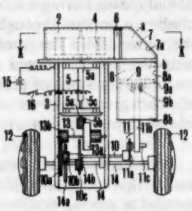
Tasuku Ono, Tokyo, Japan, assignor to Stiron Chemical Industry Co. Ltd., Tokyo, Japan

Filed Jan. 25, 1977, Ser. No. 762,411

Claims priority, application Japan, Oct. 4, 1976, 51-133988[U]

Int. Cl.[2] A63H *5/00*

U.S. Cl. 46—232 **3 Claims**



1. A sound making movable toy which is provided with a sound making device and driving wheels driven by a driving power source, said sound making device comprising: a blowing chamber being provided with a sounding aperture and a fan driven by said driving power source; a main resonance chamber adjoining said blowing chamber and communicating with said sounding aperture; a tubular resonance control chamber one side end of which communicates with said main resonance chamber and the other end of which is opened; a piston reciprocating within said resonance control chamber with sealed engagement; and a crank mechanism consisting of a movable crank rod and a rotating crank piece, one end of said rotating crank piece being connected to an end portion of a rotary shaft which is rotated by said driving power source by way of a series of gears and the other end of said rotating crank piece being pivoted to one end of said movable crank rod, and the other end of said movable crank rod being pivoted to the center of the outer surface of said piston; thereby various pitch sounds being produced by changing the resonant volume of a resonance space with the reciprocation of said piston.

4,094,095

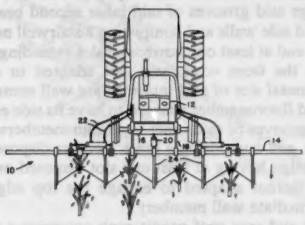
METHOD AND APPARATUS FOR USING ELECTRICAL CURRENT TO DESTROY WEEDS IN AND AROUND CROP ROWS

Willis G. Dykes, Vicksburg, Miss., assignor to Lasco, Inc., Vicksburg, Miss.

Filed May 9, 1977, Ser. No. 795,087

Int. Cl.[2] A01M *21/00*

U.S. Cl. 47—1.3 **14 Claims**



4. A machine for destroying weeds growing in and around crop rows without destruction of crops growing therein, comprising;

(a) a vehicle adapted to travel in a given direction,

(b) a source of high-voltage electricity mounted on and movable with said vehicle,

(c) means for connecting said high-voltage source of electricity to ground,

(d) a plurality of conductive spring members,

(e) means for mounting said conductive spring members so that they are disposed in generally horizontal planes, and

(f) means for providing a larger dwell time of contact between said spring members and relatively flexible weeds than the dwell time of contact between said spring members and relatively stiff crop plants, so that weeds contacted by said spring members generally receive sufficient electrical energy to result in destruction thereof while crop plants do not receive sufficient electrical energy to result in destruction thereof, said means comprising a first portion of each spring member having an end connected to said mounting means and making a first angle α with respect to a line along said direction of travel of said vehicle, and a second portion of each spring member having a free end and making a second angle $\ominus$ with respect to a line along said direction of travel of said vehicle, said second angle β being substantially greater than said angle α, and said connected end adapted to be disposed between rows of crops as said vehicle travels in said given direction; and wherein the length of said first portion of each spring member is significantly greater than the length of said second portion of each spring member; and wherein each spring member has a spring constant such that relatively stiff crop plants will deflect said spring member while relatively flexible weeds will not deflect said spring member.

4,094,096

FLOWER HOLDER

Phillip H. Huyssen, 407 Lakeland Dr., Hot Springs, Ark. 71901

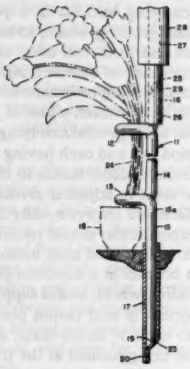
Filed Jun. 3, 1977, Ser. No. 803,230

Int. Cl.[2] A01G *5/00*

U.S. Cl. 47—41.13 **8 Claims**

1. A flower holder comprising a standard having a pair of vertically-spaced loops for receiving the stems of flowers, said standard having a lower end portion projecting downwardly below said lower loop, and a mounting tube having a length substantially less than said lower end portion and slidably

receiving said lower end portion, said lower end portion terminating in a beveled end face and said mounting tube having an



angled lower end wall for engaging said end face and restraining rotation of said standard.

4,094,097

METHOD FOR PREPARING A PESTICIDALLY RESISTANT RHIZOBIUM AND AGRONOMIC COMPOSITION THEREOF

Martin Alexander, and Oluwasuyi Odeyemi, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 10, 1976, Ser. No. 722,318
Int. Cl.[2] C12K *1/02, 3/00*; A01C *1/06, 21/00*
U.S. Cl. 47—57.6 **8 Claims**

1. A method for the preparation of a bacteria preparation intended for inoculation of leguminous seed, which preparation contains a fungicide resistant strain of Rhizobium, which strain has good infecting and nitrogen-fixing abilities in symbiosis with plants of the leguminosea family which method comprises:

cultivating, in the presence of a Rhizobium medium and an amount of a selected fungicide sufficient to kill at least 90% of the Rhizobium culture initially present, a culture of Rhizobium bacteria of selected strain and inoculation group having good infecting and nitrogen-fixing ability, whereby bacteria strains and sensitive to said amount of said fungicide are killed; subjecting the residual fungicide resistant bacteria to at least one additional cultivation step, as above, in the presence of an increased amount of said fungicide; and recovering a Rhizobium strain having increased resistance to said fungicide; said fungicide being selected from agricultrually useful legume seed or soil fungicides which adversely affect the Rhizobium bacteria being cultivated.

8. A leguminous seed having coated thereon a symbiotically-compatible, fungicide-resistance Rhizobium strain produced by the process of claim 1.

4,094,098

LOADING BLOCK FOR MUZZLE-LOADING GUN

Charles R. Gourley, 1131 Neelys Bend Rd., Madison, Tenn. 37115

Filed Apr. 4, 1977, Ser. No. 783,985
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—90 **3 Claims**

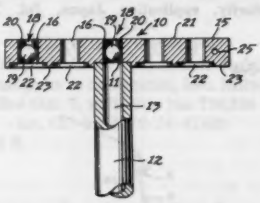
1. A muzzle-loading device for a gun having a muzzle, comprising:

(a) an elongated block having a top face, a bottom face, and a vertical dimension,

(b) a plurality of longitudinally spaced, cylindrical shot holes extending vertically through said block and opening through said top face, each of said shot holes having a uniform diameter substantially equal to the caliber of the muzzle of a gun to be loaded,

(c) each of said shot holes having a height great enough to receive a charge for the gun muzzle,

(d) a plurality of cylindrical locater recesses formed in said



bottom face, equal in number to said shot holes, each locater recess having a uniform diameter substantially equal to the outer diameter of the muzzle of a gun to be loaded, so that each of said recesses is adapted to snugly and coaxially receive said gun muzzle for loading, and

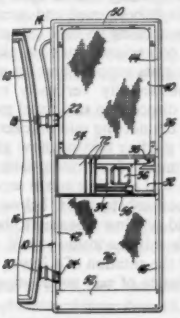
(e) each of said locater recesses being vertically coaxially aligned with, and opening into, a different shot hole.

4,094,099

SCREEN DOOR ASSEMBLY

Alexander A. Birch, 915 Phillips Ave., Clawson, Mich. 48017

Filed Jan. 14, 1977, Ser. No. 759,325
Int. Cl.[2] E06B *9/00*
U.S. Cl. 49—163 **4 Claims**



1. A screen door hinged for cooperation with and activation seperate from another closure door, said screen door comprising;

a peripheral frame including a full length hinge supported side rail, a second laterally spaced and relatively parallel side rail having an interruption between its ends, and cross rails connecting the outer and inner ends of said second side rail to said first mentioned side rail for providing relatively seperate upper and lower screen receptive sections,

a member for bridging the interruption in said second side rail received and offset inwardly between the inner ends of said second side rail,

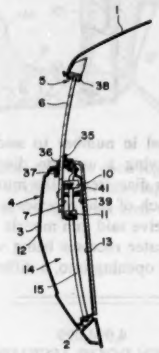
a like inwardly offset member provided on said full length hinge supported side rail,

and a pair of structural reinforcement members provided on said inner disposed cross rails and between the ends of said offset members for boxing the opening provided between said two screen receptive portions and structurally reinforcing said screen door at the mid-section thereof.

4,094,100
FREE MOVEMENT PREVENTING DEVICE FOR WINDOW GLASSES OF AUTOMOBILES

Ryoichi Fukumoto, Nagoya, and Toshiro Igarashi, Hoi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 29, 1976, Ser. No. 709,599
Claims priority, application Japan, Jul. 29, 1975, 50-105513[U]
Int. Cl.² E05F 11/38
U.S. Cl. 49—348 10 Claims

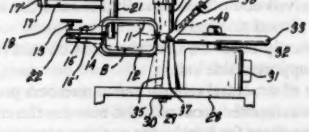


1. In an automotive vehicle including panel means which has at least one window opening and a window glass mounted in said panel means for movement substantially in a vertical direction between a closed position wherein the window glass closes the window opening and an open position wherein the window opening is fully opened and weather strips mounted along said window opening on each side of said window glass, the improvement comprising window glass mounting means including window glass support bracket means secured to the window glass, substantially vertically extending guide rail means stationarily disposed in said panel means, guide follower means for slidably connecting said bracket means to said guide rail means and for guiding said window glass along said guide rail means, power means for moving said window glass in the vertical directions, and pressing means secured to a part of said panel means spaced substantially below the weather strips mounted along said window opening to be in continuous frictional contact with only the inside of said window glass and to continuously limit the rotation of a lower part of said window glass toward the inside of said automotive vehicle.

4,094,101
ICE-SKATE SHARPENER

Bertrand Robinson, 4455 de la Naudiere Street, Montreal, Canada

Filed Apr. 1, 1977, Ser. No. 783,897
Claims priority, application United Kingdom, Apr. 1, 1976, 13178/76
Int. Cl.² B24B 53/06
U.S. Cl. 51—5 D 3 Claims

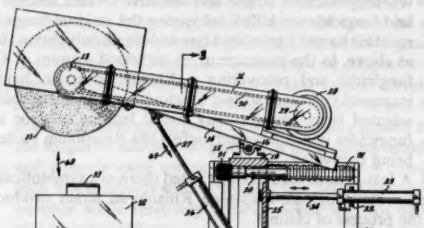


1. In an ice-skate sharpening machine including a frame, a grinding wheel rotatable about a rotation axis, a motor to rotate said wheel, a diamond bit for dressing said wheel, an arm pivoted to said frame about a pivot axis perpendicular to said rotation axis and carrying said bit in a position facing the peripheral face of said grinding wheel, so arranged that pivoting of said arm back and forth will dress said grinding wheel peripheral face along an arc of a circle lying in a plane containing said rotation axis, the improvement consisting in an ice-skate clamp comprising a bracket, a pair of jaws each pivoted on said bracket about a jaw pivotal axis lying in a plane perpendicular to said rotation axis and each having a straight jaw face for engaging an ice-skate blade, means to close and open said jaws and retain the same in adjusted pivotal position, so that said jaw clamping faces are always equally distant on each side of a datum plane perpendicular to said rotation axis and passing through said pivotal axis of said arm, means to adjust and set the position of said bracket in a direction parallel to the rotation axis of said grinding wheel, means supporting said bracket for universal movement in said datum plane, said jaws each having a U-shape to encircle an ice-skate, said ice-skate blade contacting jaw faces being located at the free edge of one leg of said U-shaped jaws, while said pivotal connection is located at the free edge of the other leg of said U-shaped jaws, and wherein said means to close and open said jaws include an extension for each jaw projecting away from the ice-skate blade contacting faces relative to said jaw pivotal axis, a threaded bushing carried by the outer end of each extension, said bracket having a leg extending between said jaw extensions, an adjusting screw having an intermediate portion rotatably mounted in the outer end of said bracket leg, means to prevent axial movement of said screw relative to said bracket leg, said screw having threads of opposite pitch on each side of said central portion respectively engaging the threaded bushing of the jaw extensions whereby rotation of said screw in one direction will open said jaws equally away from said datum plane and rotation of said screw in the opposite direction will close said jaws equally towards said datum plane.

4,094,102
OSCILLATING CUT-OFF SAW

Robert Lavern Lauze, deceased, late of Paramount, Calif., and by Vicki Suzanne Brown, administrator, 5731 Mangrum Dr., Huntington Beach, Calif. 92649

Filed Apr. 18, 1977, Ser. No. 788,555
Int. Cl.² B24B 27/04
U.S. Cl. 51—33 R 7 Claims



1. A power saw comprising:
a stationary bed having four upright posts, two of which are disposed at the two rear corners of a rectangle and the other two at the forward corners;
a pair of parallel and horizontal disposed rods, each of which is mounted by its ends near the top of two of said posts so that said rods extend fore and aft;
a relatively narrow frame having a top edge and a pair of opposing and alligned beams extending outwardly from said frame at said top edge thereof;

a pair of bearing means, each of which is fixed to one of said beams and make sliding 360° bearing contact around and with a respective one of said rods so that said frame depends from and between said rods;

a horizontally disposed axle mounted on the top edge of said frame and disposed perpendicularly to said rods;

a boom mounted on and disposed to rotate about said axle so that one end of said boom extends forward of said axle and the other end extends rearwardly of said axle;

a rotatable saw, rotatably mounted on the forward end of said boom;

a motor mounted on the rear end of said boom and having means for coupling energy to said saw to rotate said saw;

a first fluid piston and cylinder assembly, horizontally disposed and having one end directly engaging said frame and the other end fixed to said stationary bed for moving said frame along said rods; and

a second fluid piston and cylinder assembly having one end coupled to said boom and the other end coupled to said frame near the lowest portion thereof for maximum vertical movement of said saw by maximum stroke of said second assembly.

4,094,103

WORKPIECE-HOLDING FIXTURE FOR HONING MACHINE

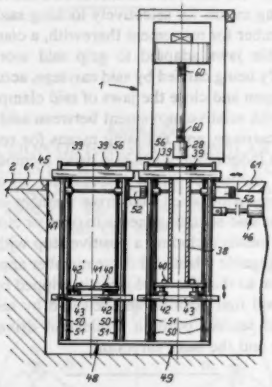
Günter Ebelt, Westerholt, Germany, assignor to Maschinenfabrik Gluckauf Beukenberg G.m.b.H., Gelsenkirchen, Germany

Filed Feb. 7, 1977, Ser. No. 765,944

Claims priority, application Germany, Feb. 6, 1976, 2604602

Int. Cl.² B24B *33/02*

U.S. Cl. 51—34 F **8 Claims**



1. A machine for honing a recess in a workpiece with a honing tool, said machine comprising:

means for rotating said tool and for simultaneously reciprocating said tool in a predetermined vertical direction;

a receiving station displaceable transverse to said direction adjacent said tool and having a pair of clamping stations each provided with

a lower table formed with a lower aperture,

centering formations for said workpiece around said lower aperture,

means for vertically displacing said lower table,

an upper abutment plate formed with a throughgoing upper aperture vertically in line with said lower aperture, and

centering formations for said workpiece around said upper aperture and directed toward said lower table;

means at each of said stations for holding a respective workpiece with its respective recess directed at said tool;

means for displacing said frame between a pair of positions in each of which a respective one of said stations is aligned in said direction with said tool; and

means for displacing said upper plates transverse to said direction into and out of position with the respective upper apertures aligned vertically with said lower aperture.

4,094,104

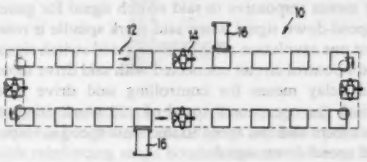
FINISHING MACHINE

Arthur S. Zerfahs, Elk Grove, and Robert J. Jurin, Chicago, both of Ill., assignors to Synergetics, Inc., Milwaukee, Wis.

Filed Oct. 7, 1976, Ser. No. 730,306

Int. Cl.² B24B *19/14, 41/00*

U.S. Cl. 51—76 R **15 Claims**



1. A finishing machine having a plurality of work stations including a continuously moving conveyor mechanism, a plurality of work piece fixtures traveling with said conveyor, each fixture having rotatable means holding a work piece, drive means in each fixture adapted to rotate said rotatable means to position the work piece for said work stations, said drive means including a follower mechanism translationally moveable with respect to said rotatable means in a direction transverse to the direction of movement of said conveyor, said machine including stationary guide means near said conveyor contactable against said follower mechanism whereby said guide means will cause translational movement of said follower mechanism with respect to said rotatable means and will actuate said drive means to position the work piece as the fixture travels on the conveyor.

4,094,105

CAM GRINDING MACHINE WITH WORKPIECE SPEED CONTROL

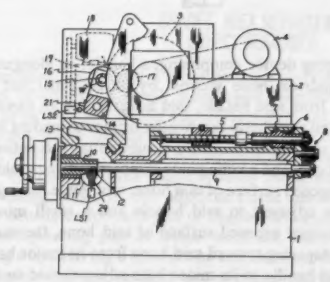
Shiro Hatanaka, Toyota; Tsuyoshi Tamesui, Okazaki, and Tsuneharu Matsuura, Kariya, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Japan

Filed Jun. 8, 1977, Ser. No. 804,596

Claims priority, application Japan, Jun. 18, 1976, 51-72563

Int. Cl.² B24B *17/00, 5/42*

U.S. Cl. 51—101 R **7 Claims**



1. In a cam grinding machine having a wheel head for rotatably carrying a grinding wheel, a rocking table being pivotable toward and away from said wheel head, a work support mounted upon said rocking table and provided with a rotatable

work spindle for supporting a cam to be ground, a work drive mechanism including a master cam and a cam follower for imparting rotational and rocking movements, synchronized with each other, respectively, to said work spindle and said rocking table, so as to generate a predetermined contour on said cam, a speed-switchable drive motor for driving said work drive mechanism selectively at fast and slow speeds, and feed means for infeeding one of said wheel head and said rocking table toward the other to cause said grinding wheel to grind said cam roughly in a first grinding step and thereafter finely in a second grinding step, the improvement of which comprises:

detecting means for generating a switch signal when the infeed movement of said one of said wheel head and said rocking table is switched from said first grinding step to said second grinding step;

delay means responsive to said switch signal for generating a speed-down signal when said work spindle is rotated at least one revolution after receiving said switch signal; and

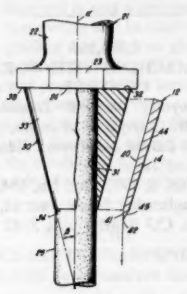
a motor control circuit connected with said drive motor and said delay means for controlling said drive motor to switch the operational speed of said work drive mechanism from said fast speed to said slow speed in response to said speed-down signal.

4,094,106

HONING DEVICE

Thomas D. Harris, Jonesboro, Ga., assignor to Southern Saw Service, Inc., Atlanta, Ga.

Filed Oct. 8, 1976, Ser. No. 730,781
Int. Cl.[2] B24D *15/06*
U.S. Cl. 51—214 **4 Claims**



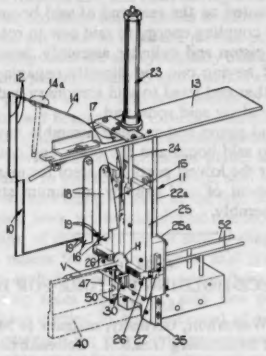
1. A honing device comprising, a handle, an elongated generally cylindrical hone secured by its proximal end to and projecting from said handle, said hone having an exposed and unobstructed peripheral sharpening surface extending from the vicinity of said handle throughout substantially its entire length to its distal end, and a knife guide disposed between said handle and said exposed surface of said hone, said guide having a large major base adjacent to said handle and a small minor base adjacent to said exposed surface of said hone, the surface of said guide tapering toward said hone from its major base adjacent to said handle to its minor base adjacent said surface for establishing the angle at which the cutting edge portion of a knife will pass unimpeded axially from the guide to and thence axially along the length of said exposed surface of said hone, said guide at its minor base being of approximately the same diameter of said hone.

4,094,107

FEED MECHANISM FOR USE IN A CENTERLESS GRINDING MACHINE

Frederick Henry Naul, Coventry, England, assignor to TRW Valves Limited, Bilston, England

Filed Jan. 14, 1977, Ser. No. 759,275
Claims priority, application United Kingdom, Jan. 14, 1976, 1284/76
Int. Cl.[2] B24B *47/20*
U.S. Cl. 51—215 CP **12 Claims**



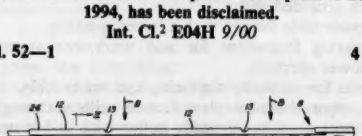
1. A feed mechanism for feeding a workpiece from a first position to a second position, comprising a drive member reciprocatable between said first and second positions, a carriage engaged with said drive member and movable relative thereto, locking means for selectively locking said carriage to said drive member for movement therewith, a clamp assembly having movable jaws adapted to grip said workpiece, said clamp assembly being carried by said carriage, actuating means operative to open and close the jaws of said clamp assembly in accordance with relative movement between said drive member and said carriage, and releasing means for rendering said locking means inoperative when said drive member is adjacent said first and second positions respectively so as to permit relative movement between said drive member and said carriage and cause said actuating means to open or close said jaws, said releasing means including a positive stop with which said carriage is engagable when said drive member approaches said second position so that the workpiece is gripped by said clamp assembly at said first position and released by said clamp assembly at said second position while said drive member is moved in one and the same direction.

4,094,108

CONTROLLED DESTRUCTIVE PANEL ASSEMBLY

Harley D. Scott, Wexford, Pa., assignor to Cyclops Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 681,820, Apr. 30, 1976, Pat. No. 4,050,204. This application Jul. 1, 1977, Ser. No. 812,119
The portion of the term of this patent subsequent to Sep. 27, 1994, has been disclaimed.
Int. Cl.[2] E04H *9/00*
U.S. Cl. 52—1 **4 Claims**



1. A wall panel construction comprising:

A. a plurality of spaced, horizontal structural girts secured to vertical, structural columns;

B. liner panels extending between each three girts with vertically adjacent panels terminating at end girts of the three in slightly spaced relationship;

C. a plurality of spaced, horizontal subgirts secured to the liner panels with certain of the subgirts positioned on either side of the end girts;

D. corrugated exterior panels extending between each of the three girts so that the corrugations are parallel to the vertical, structural columns and connected to the subgirts with vertically adjacent panels overlapping in unattached relationship, the corrugated exterior panels having a plurality of notches positioned on the exterior panel transverse of said corrugation and aligned midway between the horizontal structural girts;

E. a clip having angular flanges and secured to said end girts between the adjacent spaced liner panels, the fanges of said clip pinching the adjacent liner panels against the end girts;

F. means to attach the liner panels to a middle girt of the three girts;

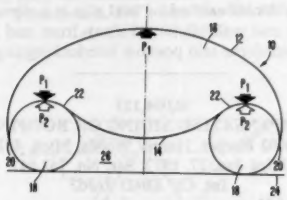
whereby an external force of predetermined magnitude against the wall panel construction causes the adjacent liner panels to deform about the middle girt as the liner panels pivot about and release from the clip flanges while simultaneously the overlapping, exterior panels pivot and release at their overlapping ends.

4,094,109

CONSTRUCTION OF HOUSES OR SIMILAR BUILDINGS BY MEANS OF AN INFLATABLE STRUCTURE

François Prouvost, 53, av. Montaigne, Paris, France (75008)

Filed Feb. 22, 1977, Ser. No. 770,848
Int. Cl.[2] E04B *1/34*
U.S. Cl. 52—2 11 Claims



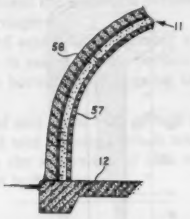
1. An inflatable support structure for constructing houses or similar buildings comprising an upper membrane and a lower membrane connected hermetically to each other along a peripheral zone thereof wherein the dimensions of the upper membrane are larger than the corresponding dimensions of the lower membrane and the upper and lower membranes form a first pressure chamber constituting an inflatable envelope, a second inflatable pressure chamber fixed to the basis of said first pressure chamber, said pressure chambers being formed of a suitable material for their utilization as support and framing in the construction of houses or similar buildings of concrete or similar or analogous materials, and wherein said first pressure chamber is inflated to a pressure lower than that of said second pressure chamber.

4,094,110

BUILDING SYSTEM AND METHOD

Luther I. Dickens, Radford, Va., and William C. Nanny, San Francisco, Calif., assignors to Radva Plastics Corporation, Radford, Va.

Filed Mar. 24, 1976, Ser. No. 670,057
Int. Cl.[2] E04B *1/32*
U.S. Cl. 52—80 5 Claims



1. A method of building fabrication comprising the steps of

(a) attaching together a plurality of expanded plastic panels with reinforcing strips bonded thereto to form a building shell having integral walls and roof;

(b) said panels having wire mesh mounted on the outer faces thereof in offset relation thereto and lacing together the wire mesh of contiguous panels to form a wire mesh covering on said shell;

(c) applying wet concrete to the exterior of said shell on said mesh to form an integral concrete wall and roof of a building with the shell attached thereto, and

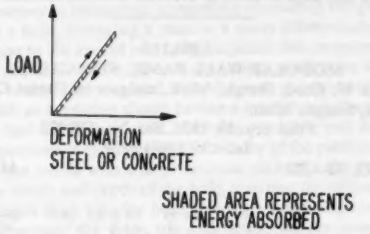
(d) applying a plaster coating to the interior of said shell to completely seal said panels between concrete and plaster as an insulating core of the resultant building.

4,094,111

STRUCTURAL STEEL BUILDING FRAME HAVING RESILIENT CONNECTORS

Patrick J. Creegan, KM. 5 Carretera A, Masaya Apart. 4397, Managua D. N., Nicaragua

Continuation-in-part of Ser. No. 558,975, Mar. 17, 1975, abandoned. This application Aug. 18, 1976, Ser. No. 715,264
Int. Cl.[2] E04B *1/98*
U.S. Cl. 52—167 10 Claims



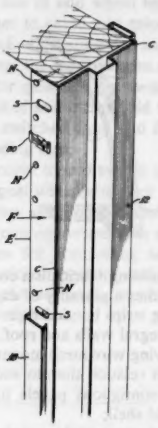
1. A building comprising: a frame having a plurality of frame members of structural metal, each frame member having a surface in face-to-face sliding engagement with the surface of an adjacent frame member, there being a number of holes through each frame member and terminating at said surface thereof, the holes of each frame member being aligned with corresponding holes of the adjacent frame member; and a resilient connector for each pair of aligned holes, respectively, of a corresponding pair of frame members, each connector including a bolt having a head at one end and a nut threaded on the opposite end, and resilient sleeve means surrounding the bolt, each connector extending through a respective pair of aligned holes with the head of the corresponding bolt engaging one frame member and the corresponding nut engaging the other frame member and forcing the corresponding surfaces into said face-to-face sliding engagement with each other.

4,094,112

METAL DOOR FRAME AND TRIM CLIP

Edward A. Smith, 6641 W. 6th St., Los Angeles, Calif. 90048, and Robert L. Day, 1518 Grismer St., Burbank, Calif. 91504

Filed Jul. 23, 1974, Ser. No. 491,102
Int. Cl.[2] E06B 1/04
U.S. Cl. 52—211 8 Claims



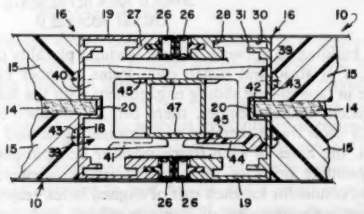
1. In a door frame structure:
(a) a frame part having a flange extending from a corner with the body of the flange adapted to lie flat along a wall surface adjoining a wall opening; said flange having a distal edge that deviates from parallelism with said corner;
(b) said flange having a series of integrally formed longitudinally spaced discrete clip registers each located at the same constant predetermined dimensionally controlled distance from said corner;
(c) a series of molding clips fitted and rigidly secured at said clip registers respectively; and
(d) a trim molding member attached to said flange by said molding clips;
(e) the distal edge of said flange having a series of preformed notches of variable depths interfitting corresponding ends of said clips to assist in accurate location thereof.

4,094,113

MODULAR WALL PANEL STRUCTURE

Wayne W. Good, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.

Filed Sep. 30, 1976, Ser. No. 728,433
Int. Cl.[2] E04B 2/74
U.S. Cl. 52—222 11 Claims



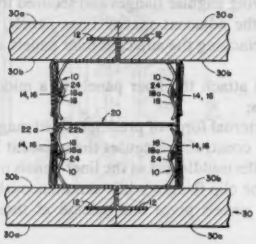
1. A wall panel module having a rectangular frame comprising outwardly open side channels with laterally outwardly extending resilient outer edges adapted for abutting the resilient outer edges of like modules to form a vertical partition wall and the like having a resilient butt joint spacing apart the interfacing edges of adjoining panels, a vertical spline in at least one side channel having a width not exceeding the lateral depth of said channel and movable laterally therein to clear the outer edge of said channel, the web of said channel having a longitudinal internal rib, clip means mounted on said rib for releasably holding said spline in a position medial of said outer edge, and said spline being engageable by traversing a resilient edge of said channel for moving said spline laterally in said channel.

4,094,114

DETACHABLE WALL MOUNTING SYSTEM

Gerald C. Burcham, P.O. Box 285, Mountain View, Calif. 94040

Filed Aug. 26, 1976, Ser. No. 717,826
Int. Cl.[2] E04B 5/52
U.S. Cl. 52—489 2 Claims



1. A system for supporting a plurality of side-by-side individually detachable wall panels in a wall plane comprising:
(a) a plurality of vertically disposed support studs each having at least one flange portion oriented perpendicular to said wall plane;
(b) a bead formed on a surface of said flange portion and extending vertically along said flange surface substantially the entire length thereof;
(c) a plurality of panel retaining clips each having a panel attachment portion formed for piercing an edge of one of said wall panels and a stud attachment portion formed for slideable insertion onto said stud flange; and
(d) a barb formed on said stud attachment portion of each of said clips, said barb being oriented toward said wall plane for positive interlocking engagement behind said bead when said clip is slideably inserted onto said flange, whereby forces exerted on said clip in a direction transverse to said wall plane and away from said stud act to further reinforce said positive interlocking engagement.

4,094,115

SELF-COMPENSATING SIDING OR ROOFING STRIP

Paul Naz, 20502 Harper, Harper Woods, Mich. 48225

Filed Jan. 27, 1977, Ser. No. 762,847
Int. Cl.[2] E04D 3/362
U.S. Cl. 52—521 10 Claims

1. An integrally formed, interlocking strip for use as siding, roofing and the like to cover surface areas of buildings comprising:
a generally rectangular panel having an interior surface, an exterior surface, an upper end portion, a lower end portion and a generally flat intermediate central portion between said upper and lower end portion, said upper end portion being generally coplanar with said intermediate central portion and the interior surface of said upper end portion being integrally contiguous with the interior surface of said intermediate central portion;
a first spacing and interlocking assembly integral with and extending outwardly from said exterior surface of said panel and disposed a first distance from the distal end of said upper end portion for spacing the lower end portion

of a later installed strip while operatively engaging same for interlocking purposes;

a second spacing and interlocking assembly integral with and extending outwardly from said interior surface of said panel adjacent said lower end portion thereof for spacing said lower end portion a second spaced distance away from the surface of said building being covered while operatively engaging said exteriorly extending first assembly of a previously installed strip for interlocking said strips together one above the other; and

only a portion of said upper end portion disposed between said first assembly and the distal end of said upper end

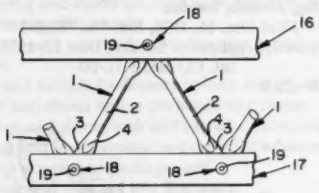
portion including corrugation means extending from said upper distal end toward and terminating short of said first distance, said corrugation means having alternate ridge and valley portions adapted to engagably receive fastening means therethrough for fixedly securing said strip to the surface of said building being covered, said corrugation means cooperating with said building surface being covered and said fastening means for (1) compensating for expansion and contraction of said strips with changing weather conditions and (2) achieving a spring-type buckle washer effect for maintaining a tight fit therebetween thereby preventing said strips from working lose and eliminating rattling and the like.

4,094,116

WEB TUBE WITH SEPARATED END WALLS

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Manufacturing Co., Inc., San Leandro, Calif.

Filed Jun. 6, 1977, Ser. No. 803,443
Int. Cl.[2] E04C *3/292*
U.S. Cl. 52—693 **1 Claim**



1. In medium and heavy series composite wood chord and metal web member trusses having double wood members for the top and bottom chords and joint means including transverse bores formed in said chords, a metal joint connector connected to said chord and formed with an opening therethrough in registration with said transverse bores in said chord and a single metal pin at each of said joints inserted through said bores in said chords and said opening in said metal joint connector the improvement comprising:

a. a plurality of tubular metal web members formed from an open ended cylindrical metal tube formed with openings at both ends connected to said chords by said pins; and

b. said tubular metal web members are formed with:

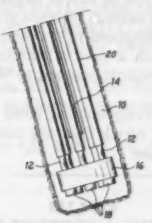
1. an elongated tubular body portion;
2. a smoothly tapered and unshouldered transition portion including a bulb section integrally connected to said body portion and flat side portions on both sides of said bulb section;
3. a smooth sided, unshouldered flattened end portion formed adjacent the transition portion with a pin opening therethrough;
4. said walls of said tubular member are separated from one another in said transition portion and said flattened end portion between said opening and said body portion; and
5. said walls of said distal ends of said tubular web members beyond said openings are in touching contact for maintaining the separation of said walls between said opening and body portion.

4,094,117

METHOD AND TIE BAR FOR THE FORMATION OF ANCHORAGES

Giovanni Torti, Pavia, and Andrea Tomiolo, Milan, both of Italy, assignors to Ing. Giovanni Rodio & C. Impresa Costruzioni Speciali S.p.A., Italy

Filed Nov. 22, 1976, Ser. No. 743,918
Claims priority, application Italy, Nov. 26, 1975, 29665 A/75
Int. Cl.[2] E21D *20/2*
U.S. Cl. 52—698 **8 Claims**



1. A method of forming an anchorage for a plurality of cables subject to tensioning, comprising excavating the ground to form a hole, arranging a plate in a plane substantially perpendicular to the axes of said cables adjacent the common ends thereof and securing the plate to the cables, coating the length of each of said cables spaced from the ends engaged with the plate with an insulating sheath having a low friction characteristic so that cables may slide, enclosing the plate and the uncoated portions of the cables in the vicinity of the plate and the ends of the cables with a large resinous mass of a size smaller than the width and depth of the hole, inserting the cables with the resinous mass into the hole, leaving a remaining space in the hole around the sides, top and bottom of the mass, and injecting mortar into the remaining space so as to form a mortar bulb around, above and below the resinous mass in said cables and permitting it to harden.

4,094,118

METHOD AND APPARATUS FOR FEEDING OF ROWS OF BLOCKS

Hans Lingl, Sr., Neu-Ulm, Ludwigsfeld, Germany, assignor to Lingl Corporation, Paris, Tenn.

Filed Oct. 8, 1976, Ser. No. 731,095
Int. Cl.[2] E04G *21/22;* E04D *1/35*
U.S. Cl. 52—747 **10 Claims**

1. Apparatus for fabricating a vertical block wall section having a width W, comprising

(a) a first conveyor belt system, said first conveyor belt

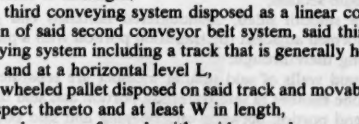
system having an upper transporting surface thereof that is generally horizontal and at a horizontal level L, and at least W in length,

(b) a second conveyor belt system disposed as a continuation of said first conveyor belt system and having an upper transporting surface thereof that is generally horizontal and is normally disposed at the horizontal level L, and is at least W in length,

(c) a third conveying system disposed as a linear continuation of said second conveyor belt system, said third conveying system including a track that is generally horizontal and at a horizontal level L,

(d) a wheeled pallet disposed on said track and movable with respect thereto and at least W in length,

(e) track means formed with said second conveyor belt system, said track means including two separate track



rails, one disposed on either side of the conveyor belt of said second conveyor belt system and so disposed with respect to said second conveyor belt system that when said pallet cooperates with said track means said pallet is disposed above the upper transporting surface of said second conveyor belt,

(f) means for vertically moving said second conveyor belt system so that a row of blocks disposed thereon may be elevated at least a vertical distance great enough to allow said pallet to be disposed in cooperation with said track means and beneath a row of blocks when the row of blocks is in the vertical position to which it may be elevated, and

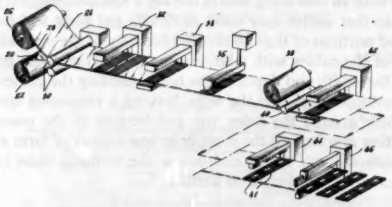
(g) means for selectively holding rows of blocks in an elevated position to which they are movable by said vertically moving means.

4,094,119

METHOD OF MAKING A PRODUCT FOR DISPENSING A VOLATILE SUBSTANCE

William E. Sullivan, Columbia, S.C., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed Mar. 18, 1977, Ser. No. 778,855
Int. Cl.² B65B *29/00*; A24F *25/00*
U.S. Cl. 53—4 **10 Claims**



1. A method of producing a product for holding and dispensing a volatile substance in vapor form into the environment, said method comprising the steps of:

A. providing a backing material;

B. placing a reservoir material, capable of holding the volatile substance, in close proximity to the backing material;

C. placing a material permeable to the volatile substance in close proximity to the reservoir material;

D. supplying the volatile substance to the reservoir material to be held thereby; and

E. fusing the backing, reservoir and permeable materials together in a pattern defining a closed loop periphery to seal the reservoir material between the backing and permeable materials, said fusing step compressing and sealing the reservoir material to prevent transfer of the substance through the fused periphery.

4,094,120

METHOD OF MANUFACTURING A PAIR OF PLASTIC GLOVES AND PACKAGING THEM WITHIN A SHEET OF WRAPPING MATERIAL

Antonin Goncalves, Groslay, France, assignor to L'Oreal, Paris, France

Filed Nov. 22, 1976, Ser. No. 743,629
Claims priority, application France, Jan. 14, 1976, 76 00825
Int. Cl.² B65B *63/04*
U.S. Cl. 53—21 FW **8 Claims**

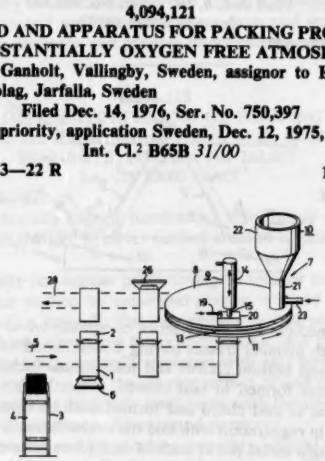
1. A process of making and wrapping a pair of plastic gloves in a sheet of wrapping material comprising, the steps of, positioning at least two superposed sheets of plastic material in superposed relation to a sheet of flexible wrapping material, welding edge to edge and cutting out a flat member from said plastic sheets of an outline to form said pair of gloves connected together along a cuff region, said step of positioning further comprising positioning the wrapping material only under that part of the superposed plastic sheets which forms a first one of said gloves upon cutting and welding, adhering said first glove to said wrapping material during said step of cutting and welding, forming a weakened tear line through the cuff region of said member, folding said gloves over each other, and then folding the assembly of the wrapping sheet and the two gloves into a package.

4,094,121

METHOD AND APPARATUS FOR PACKING PRODUCTS IN SUBSTANTIALLY OXYGEN FREE ATMOSPHERE

Bo Olov Ganholt, Vallingby, Sweden, assignor to Esseltepac Aktiebolag, Jarfalla, Sweden

Filed Dec. 14, 1976, Ser. No. 750,397
Claims priority, application Sweden, Dec. 12, 1975, 7514648
Int. Cl.² B65B *31/00*
U.S. Cl. 53—22 R **12 Claims**



1. A method of packing products, without vacuum suction

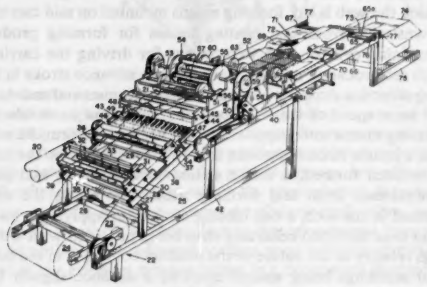
or compression and in a substantially oxygen free atmosphere, in bottom closed containers of cardboard, plastic, glass, tin or the like, said method comprising mounting a bottom-closed container in a substantially air tight condition on a holder funnel; forcing a piston in sealed engagement with the inner sides of the container down through the container to the bottom thereof so that air which is present in the container is forced up to the upper side of the piston; withdrawing the piston from the container to thereby exhaust the air which is present above the piston; introducing a protective gas underneath the piston simultaneously with the withdrawal of the piston and without subjecting the interior of the container to the influence of air as the container is filled with the product to be packed; and thereafter transfering the container to a station for sealing and closing the container after the same is filled with the product and the protective gas, said container being maintained under substantially air tight conditions by the holder funnel during the entire filling operation and during at least an initial portion of the sealing operation.

4,094,122

APPARATUS FOR HANDLING EXTRUDABLE SUBSTANCES

Raymond S. Edmunds, Jr., 817 Eventide Dr., San Antonio, Tex. 78209

Filed Jun. 3, 1977, Ser. No. 803,050
Int. Cl.[2] B65B *63/00*
U.S. Cl. 53—23 **22 Claims**



1. A method of handling and individually wrapping packages of a continuously extruded substance, said method including the following steps:

dispensing a wrapping material by dispensing means;

receiving and cutting said wrapping material into sheets by first roller means;

overlapping said sheets received from said first roller means by second roller means;

depositing said extruded substance along said overlapped sheets;

cutting said extruded substance at least at the point of overlap of said sheets with a perpendicular cutter;

separating said sheets with said extruded substance thereon;

wrapping said sheets around said extruded substance thereon to form a wrapped package; and

conveying said package to a container.

4,094,123

METHOD AND APPARATUS FOR THE ALIGNMENT OF ELONGATED ARTICLES

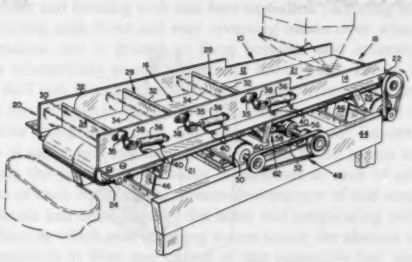
Bayard L. Carlson, Wilsonville, Oreg., assignor to Amfac Foods, Inc., Portland, Oreg.

Filed Mar. 7, 1977, Ser. No. 774,804
Int. Cl.[2] B65B *1/22, 35/56*
U.S. Cl. 53—24 **36 Claims**

25. A process for aligning multiple articles comprising:

depositing a batch of said articles onto the upstream end of a trough which is divided into a series of compartments by multiple transverse barriers;

moving said batch through said trough toward the downstream end thereof; and



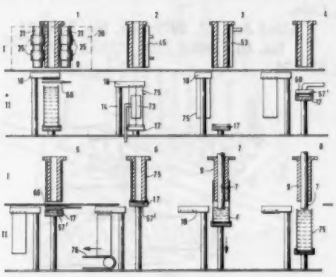
alternately bunching up said articles of said batch against a downstream barrier whereby said articles tend to move into alignment with said barrier and dispersing the articles in said trough without substantially changing their alignment in relations to said barrier.

4,094,124

PROCESS AND APPARATUS FOR THE MANUFACTURE OF FILLED, CLOSED CONTAINERS

Billy Ljungcrantz, Chatel-St.Denis, Switzerland, assignor to La Coulaz, Switzerland

Filed Jan. 27, 1977, Ser. No. 763,139
Claims priority, application Switzerland, Jan. 27, 1976, 999/76
Int. Cl.[2] B65B *1/02, 3/02*
U.S. Cl. 53—29 **24 Claims**



1. In a process for manufacturing filled, closed containers made of a foldable material and having a tubular wall section of any cross-section, a bottom and a lid, wherein the material for the wall section, the bottom and the lid is fed in separately and the container is filled and closed with the lid after fixing the container bottom in place, the combination of process steps comprising:

(a) providing a first rotating tier located at a first level of operation,

(b) providing a second rotating tier located at a second level of operation, and

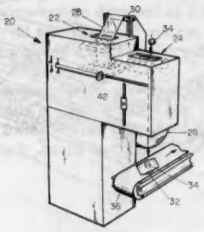
(c) effecting at least one of the operations of shaping and welding the tubular wall section and the attaching of the bottom and lid to said wall section in said first rotating tier and effecting the remaining operations in said second rotating tier.

4,094,125

PACKAGING MACHINE

Larry C. Gess, 13345 Dunlap Rd., LaSalle, Mich. 48145

Filed Nov. 1, 1976, Ser. No. 737,602
Int. Cl.² B65B *5/02, 43/00*
U.S. Cl. 53—29 **16 Claims**



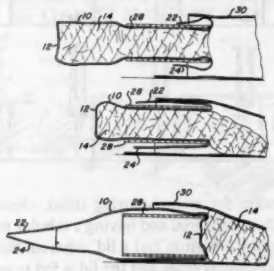
7. A method for making packages sequentially from a length of plain flexible tubing, said method comprising maintaining the tubing flat with the tubing positioned in a given plane, advancing the tubing lengthwise with the leading edge transversely sealed and stopping the advance, forming a sealed strip transversely across the tubing at a distance from the sealed leading edge at a first station, severing the tubing on the leading edge side of the sealed strip, transferring the severed section to a second station to one side of the first station in a direction parallel to the plane of the tubing, opening the severed edges of the section at the second station, depositing an article in the section at the second station, closing the severed edges at the second station, forming a transverse seal across the section near the severed edges at the second station, and discharging the package from the second station.

4,094,126

METHOD FOR FILLING DOWN GARMENTS

George D. Lamb, Longmont, Colo., assignor to Camp 7, Longmont, Colo.

Filed Jun. 27, 1977, Ser. No. 810,523
Int. Cl.² B65B *1/00, 29/00, 39/00*
U.S. Cl. 53—35 **2 Claims**



1. The method of inserting down in garment compartment having one open side, and in which a tubular plastic film packet of down is provided with the down quantity necessary for the down compartment, comprising:

(a) placing the down packet in an essentially rigid tube,

(b) opening one end of the down packet,

(c) placing the open end of the down packet into a garment down compartment, and

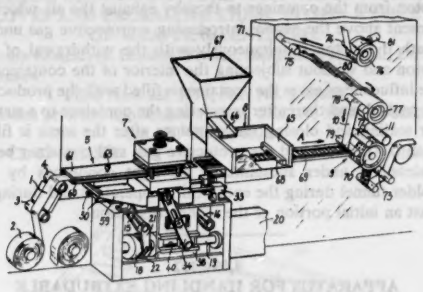
(d) pulling the tubular packet back over the rigid tube from the compartment outwardly to turn the same inside-out and deposit the down in the garment compartment.

4,094,127

APPARATUS FOR FORMING, FILLING AND CLOSING PLASTICS TRAYS

Andrea Romagnoli, Via Madonna dei Boschi, 18, S. Lazzaro di Savena (Prov. of Bologna), Italy

Filed Nov. 29, 1976, Ser. No. 745,939
Int. Cl.² B65B *41/18, 47/02*
U.S. Cl. 53—51 **1 Claim**



1. An apparatus for manufacturing blister packs comprising means for continuously entraining a web of thermodeformable plastic material at a constant speed along a horizontal path, a carriage slidingly supported along said path and parallel thereto, heating means for heating the web consisting of a pair of superimposed plates mounted on said carriage between which the web is led, forming means mounted on said carriage downstream from said heating means for forming product containing cells on said web, means for driving the carriage with reciprocating motion comprising an advance stroke in the web direction during which the carriage reaches and maintains the same speed of the web for a time sufficient to enable the forming means to engage with the latter and to form the cells and a return stroke opposite the web direction after the cells have been formed, a filling station located along said path downstream from said forming means for filling the cells formed in the web, a cell closing station for applying a metal strip over the filled cells, said strip being provided with wordings relative to the nature of the product contained in the cells, said wordings being spaced apart by a distance slightly less than the longitudinal dimension of the packs, means for detecting the position of said wordings with respect to the relative cells and a stretching device controlled by said detecting means so as to cause elongation of the strip when the wordings are in misalignment with the relative cells and to restore alignment of the wordings with the relative cells wherein according to the improvement the stretching device is of the type comprising a plurality of stationary parallel bars having edges transversely and alternately engaging the opposite faces of said metal strip so as to deviate it according to a zig-zag path, a pair of rollers arranged upstream and downstream from said bars on which the metal strip is partially wound and braking means controlled by said detecting means for braking the roller arranged upstream and causing the strip to be put under tension and to elongate by sliding on said bars.

4,094,128

AUTOMATIC BAGGING MACHINE

Vincent N. Vulcano, New York, N.Y., and Maurice W. Friedman, 548 Barnard Ave., Woodmere, N.Y. 11598, assignors to Maurice W. Friedman, Woodmere, N.Y.

Filed Sep. 10, 1976, Ser. No. 722,322
Int. Cl.² B65B *57/00, 5/04*
U.S. Cl. 53—52 **44 Claims**

44. Apparatus for automatically placing garments into garment bags including:

a. means for locating a garment at a loading station;

b. means for transporting said garment from its location at

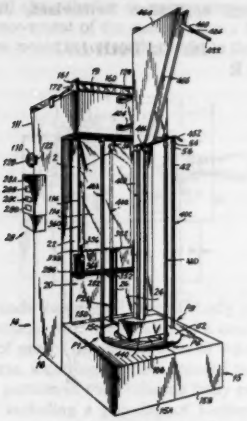
said loading station, to an operative station, to an unloading station;

c. means for supplying a length of tubular material;

d. means for forming a garment bag from the tubular material over a garment located at the operative station;

e. means for sensing said garment bag so that it has a length corresponding to the length of the garment comprising gripping means to grip the edge of the tubular material and means to move the gripping means, and

f. control means for actuating the means of paragraphs (a) through (e) in sequence, as a function of the presence of a garment at the operative station;



wherein the sensing means determines the presence of a garment at the operative station and further including means for mounting a photoelectric detection means for movement relative to gripping means between a position at which the photoelectric detection means and the gripping means are adjacent each other and a position at which the photoelectric detection means and the gripping means are distant each other, and means for moving the photoelectric detection means from its distant position to its adjacent position upon initiation of movement of the gripping moving means in a downward direction.

4,094,129

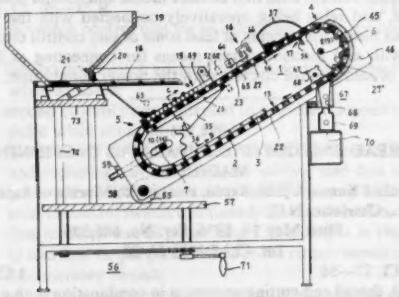
COUNTING AND FILLING APPARATUS FOR TABLETS, DRAGEES OR SIMILAR ELEMENTS

Hans List, Laustrasse 51, 7 Stuttgart 70, Germany

Filed Aug. 1, 1977, Ser. No. 820,788

Int. Cl.[2] B65B *57/10, 57/20*

U.S. Cl. 53—54 **51 Claims**



1. A counting and filling apparatus for tablets, dragees or similar elements, comprising, in combination, a plurality of elongated counting bars having longitudinal side faces and being each provided with cutouts spaced from each other in the longitudinal direction of each bar and each extending transversely through the respective bar; carrier elements carrying said bars substantially normal to said carrier elements with the side faces of the bars closely adjacent and parallel to each other and forming with said bars an endless receiving and transporting unit; front and rear reversing means over which said endless unit is guided to form between said reversing means substantially planar upper and lower runs; means to move said unit in an endless path about said reversing means; means for filling said cutouts in said bars during movement of the latter along said upper run with said element; scanning means at said upper run downstream of said filling means for scanning the presence or absence of elements in each of said cutouts of each counting bar; means downstream of said scanning means and controlled by the latter and cooperating with those bars in which said scanning means senses the absence of an element in at least one cutout of the respective bar; and boundary means directly below said counting bars travelling along said upper run for preventing elements in said cutouts to fall out of the latter.

4,094,130

APPARATUS FOR COMPRESSING AND PACKAGING ARTICLES

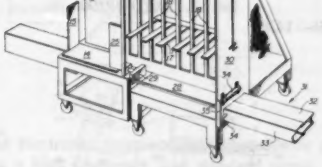
Norman Kelly; William T. Fletcher, both of Sarnia; Derek J. Holden, Camlachie, and James J. Welsh, Sarnia, all of Canada, assignors to Fiberglas Canada Limited, Toronto, Canada

Filed Jul. 13, 1977, Ser. No. 815,356

Claims priority, application Canada, Apr. 19, 1977, 276433

Int. Cl.[2] B65B *63/02, 13/20*

U.S. Cl. 53—124 D **18 Claims**



1. Apparatus for compressing and packaging articles, comprising:

means for receiving the articles in succession and depositing the articles in a first position in successive batches each comprising a stack of the articles;

a compression chamber;

means for displacing the batches in succession from said first position to a second position in said compression chamber;

means for displacing a first one of the batches from the second position to a third position in said compression chamber to allow the displacement of the next succeeding batch from the first position to the second position;

means for compressing the first batch and the next succeeding batch together in said compression chamber; and

means for applying to the compressed batches retaining means for retaining the batches in their compressed condition.

4,094,131
ANIMAL HALTER

Sylvia C. McElvey, Box 107, Middleburg, Va. 22117

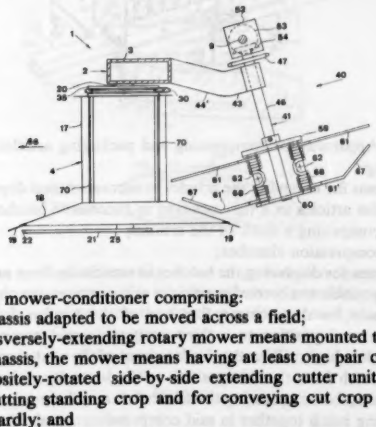
Filed Dec. 12, 1975, Ser. No. 640,193
Int. Cl.² B68B *1/02*
U.S. Cl. 54—24 3 Claims

1. An animal halter comprising a crown member for positioning behind the ears and across said animal, band means for surrounding the nose of said animal, cheek strap means for attaching said band means to said crown member on opposite sides of said halter, means extending from one side of said halter to the other and positioned to pass beneath the head of said animal rearwardly of said band means, and means for releasably holding said crown member intact on said animal, said releasably holding means being operative to disunite said crown piece upon the imposition of a force on said halter which is less than that otherwise needed to break the halter, and means for inactivating said releasable means, said means for releasably holding said crown member comprising a relatively weak strap portion in said crown member, and said means for inactivating said releasable means comprising a member adapted for releasable connection in a bridging position across said relatively weak strap portion of said crown member to relieve stress on said relatively weak strap portion.

4,094,132
MOWER-CONDITIONER

Frans J. G. C. Decoene, Zedelgem, Belgium; Cornelis G. M. Muijs, Vougeot, France; Roger H. Van Eecke, Blankenberge, and Marc G. Vansteelant, Zedelgem, both of Belgium, assignors to Clayson N.V., Zedelgem, Belgium

Filed Oct. 18, 1976, Ser. No. 733,631
Claims priority, application United Kingdom, Oct. 23, 1975, 43506/75
Int. Cl.² A01D *49/00*
U.S. Cl. 56—14.4 19 Claims

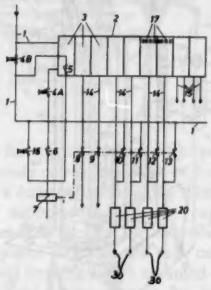


1. A mower-conditioner comprising:
a chassis adapted to be moved across a field;
transversely-extending rotary mower means mounted to the chassis, the mower means having at least one pair of oppositely-rotated side-by-side extending cutter units for cutting standing crop and for conveying cut crop rearwardly; and
a pair of rotary units mounted to the chassis and rearwardly of each pair of cutter units of the mower means for receiving cut crop from the cutter units, for conditioning said crop and for widely spreading and depositing said crop in a fluffy pattern on the field; and each rotary unit being rotatable about a generally upright axis and with one rotary unit of each pair being located closer to the mower means than the other rotary unit of the pair.

4,094,133
METHOD AND APPARATUS FOR CONTROLLING AN OPEN-END SPINNING MACHINE

Edwin Furrer, Winterthur, Switzerland, assignor to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Jun. 25, 1976, Ser. No. 700,061
Claims priority, application Switzerland, Jul. 16, 1975, 9298/75
Int. Cl.² D01H *1/32*
U.S. Cl. 57—34 R 8 Claims



1. In a method of controlling the start-up, the normal spinning operation and the stopping of all spinning positions of an open-end spinning machine comprising an electronic control unit supplied with power from a power source via a power line, and control circuits extending from the electronic control unit to devices which influence the operation of the spinning positions, the improvement comprising maintaining the normal spinning operation of the spinning positions of the open-end spinning machine in case of failure of the electronic control unit by continuing to supply power for the normal spinning operation from said power source to at least some of said control circuits.

4. An apparatus for controlling the start-up, the normal operation and the stopping of all spinning positions of an open-end spinning machine comprising an electronic control unit, a power supply line for delivering power to the electronic control unit, control circuits extending between the electronic control unit and the spinning positions for influencing the operation of such spinning positions, a relay provided with a self-holding contact, a switch connecting the relay with the electronic control unit, first contact means and second contact means, said relay being operatively connected with the first contact means for opening at least some of said control circuits and with said second contact means for connecting at least some of said control circuits with the power supply line.

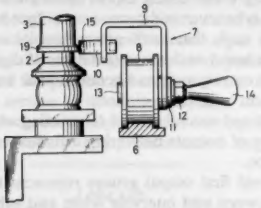
4,094,134
THREAD END CUTTING APPARATUS IN SPINNING MACHINE

Nakanishi Kazuo, Ujishi, Japan, assignor to Murata of America Inc., Charlotte, N.C.

Filed May 14, 1976, Ser. No. 686,398
Int. Cl.² D01H *11/00*
U.S. Cl. 57—56 1 Claim

1. A thread end cutting apparatus in combination with a fine spinning machine, which fine spinning machine includes a row of rotatable spindles and in combination with a separate bobbin mounted on each of the respective spindles having an annular metal fitting on one end thereof and wherein the leading end of

thread to be wound on a bobbin on rotation of the associated spindle is placed between the bobbin and spindle as the bobbin is sleeved over the spindle and wherein the leading end of the thread so placed between a bobbin and spindle is passed over the metal fitting prior to being wound on the bobbin, which cutting apparatus includes a guide bar positioned adjacent the row of spindles and parallel thereto and a cutter device mounted on the guide bar for movement therealong parallel to the row of spindles, which cutter device includes a support arm extending longitudinally of the bar, a roller adjacent each end of the support arm, shafts rotatably mounting the rollers, each roller having a peripheral configuration whereby the roller is guided along the bar on engagement of the roller with the bar and movement of the cutting device longitudinally of the bar, screw means securing the shafts to the support arm at



the opposite ends thereof, a U-shaped body portion having a pair of leg portions with free ends and a connecting portion, the free end of one of the leg portions of which is secured to the support arm, a cutting member secured to the free end of the other leg portion of the U-shaped body portion, said cutting member including a plurality of L-shaped attachments secured thereto in spaced apart relation longitudinally of the bar, a pair of leaf springs connected to each attachment providing cutting surfaces extending longitudinally of the bobbins in spaced apart relation longitudinally of the bar with the cutting device positioned on the bar for movement therealong, said cutting surfaces being adapted to resiliently engage the annular metal fittings on the bobbins on movement of the cutting device along the bar to engage and cut the leading end of the thread placed between the bobbin and spindle.

4,094,135

SWITCH CONTROL UNIT FOR ELECTRONIC TIMEPIECE

Yasushi Nomura, Tokorozawa, and Shigeru Morokawa, Higashiyamato, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed May 24, 1976, Ser. No. 689,021

Claims priority, application Japan, May 26, 1975, 50-61945; Aug. 14, 1975, 50-98808

Int. Cl.[2] G04C 3/00

U.S. Cl. 58—23 R **12 Claims**

1. A switch control unit for an electronic timepiece comprising:

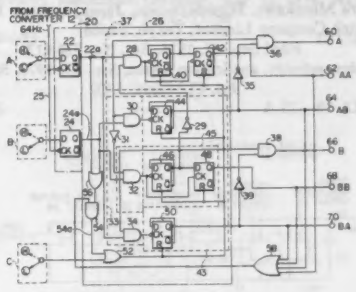
a first control switch adapted to provide a first output pulse when actuated;

a second control switch adapted to provide a second output pulse when actuated;

a first memory circuit connected to said first control switch and including circuit means for storing said first output pulse when said first control switch is actuated before said second control switch is actuated, the circuit means of said first memory circuit generating a first output in response to said first output pulse stored in the circuit means of said first memory circuit;

a second memory circuit connected to said second control switch and including circuit means for storing said second output pulse when said second control switch is actuated before said first control switch is actuated, the circuit means of said second memory circuit generating a second output in response to said second output pulse stored in the circuit means of said second memory circuit; and

discrimination gate means including a first gate responsive to said first output and said second output pulse for thereby generating a first output signal representative of a first



sequence of actuations of said first and second control switches, and a second gate

responsive to said second output and said first output pulse for thereby generating a second output signal representative of a second sequence of actuations of said first and second control switches.

4,094,136

ELECTRONIC TIMEPIECE INSPECTION CIRCUIT

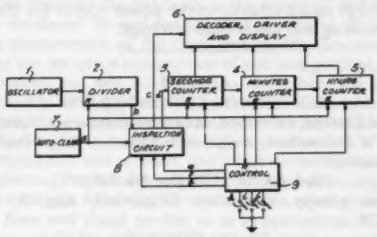
Hitomi Aizawa, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,129

Claims priority, application Japan, Dec. 24, 1975, 50-154284

Int. Cl.[2] G04C 3/00

U.S. Cl. 58—23 R **9 Claims**



1. In an electronic timepiece having oscillator means for producing a high frequency time standard signal, a divider means for receiving said high frequency time standard signal and producing a lower frequency time standard signal in response thereto, timekeeping counter means for producing timekeeping signals representative of actual time in response to said lower frequency time standard signal being applied thereto, and display means for displaying time in response to said timekeeping signals being applied thereto, the improvement comprising auto-clear means coupled to said timekeeping counter means and said divider means for detecting a power-on condition and in response thereto for applying a reset pulse signal to said counter means and divider means to reset the counts thereof, and first inspection means coupled intermediate said divider means and timekeeping counter means, said first inspection means being adapted to receive said reset signal and in response thereto apply a first inspection signal to said display means until said lower frequency time standard signal is applied to said inspection means at a predetermined interval of time after said reset signal is applied to said inspection means so

that a first inspection of said display means is effected during said predetermined interval of time.

4,094,137

VOLTAGE CONVERSION SYSTEM FOR ELECTRONIC TIMEPIECE

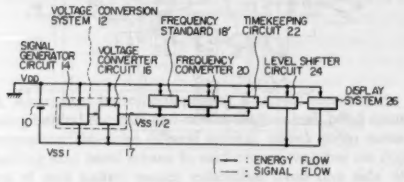
Shigeru Morokawa, Higashiyamato, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Sep. 22, 1976, Ser. No. 726,013

Claims priority, application Japan, Sep. 27, 1975, 50-116620

Int. Cl.² G04C *3/00*

U.S. Cl. 58—23 A **39 Claims**



1. An electronic timepiece having a power source, comprising:

a frequency standard;

a frequency converter coupled to said frequency standard to divide an output frequency of said frequency standard to provide output pulse signals;

a timekeeping circuit driven by said output pulse signals;

display means for displaying the contents of said timekeeping circuit; and

a voltage conversion system coupled to the power source to provide a lower output voltage than that of the power source to operate at least one of said frequency standard, frequency converter, timekeeping circuit and display means at the lower output voltage from said voltage conversion system, said voltage conversion system including a plurality of electric energy storage means, and means for switching connections of said plurality of electric energy storage means relative to the power source for thereby providing said lower output voltage.

4,094,138

ELECTRONIC CHRONOGRAPH

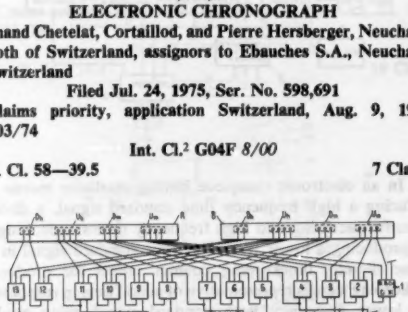
Fernand Chetelat, Cortaillod, and Pierre Hersberger, Neuchatel, both of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed Jul. 24, 1975, Ser. No. 598,691

Claims priority, application Switzerland, Aug. 9, 1974, 11303/74

Int. Cl.² G04F *8/00*

U.S. Cl. 58—39.5 **7 Claims**



1. An electronic chronograph for calculating the difference between two intervals of time, each decimal digit of which is represented as a binary word, comprising

a subtracting circuit including a plurality of functionally similar subtracting units connected to form a plurality of sets of parallel groups, each group representing a decimal digit and comprised of a plurality of parallel subtracting units, said subtracting circuit comprised of

a first set of said subtracting units including a group of subtracting units for each word for producing the time differences between each corresponding word of said intervals of time, the subtracting unit of highest significance of each group having a carry-over output, and

a second set of said subtracting units including groups of subtracting units interconnected each with a group of said first set, each group of said second set having a control input of at least one of its subtracting units connected to said carry-over output of the corresponding group of said first set of subtracting units for subtracting a correcting cipher from each of said differences whenever said carry-over output has a carry-over signal such that each group has its own correcting cipher based on the resultant decimal digit to which that group corresponds and hence at least two groups have different correcting ciphers,

said first and second sets of subtracting units having first groups of outputs delivering a first corrected time difference,

whereby said first output groups represent the time difference between said intervals when said subtrahend is less than said minuend, and the complement of said set of output groups represent the time difference between said intervals when said subtrahend is greater than said minuend.

4,094,139

DISPLAY CONTROL CIRCUIT FOR ELECTRONIC TIMEPIECE

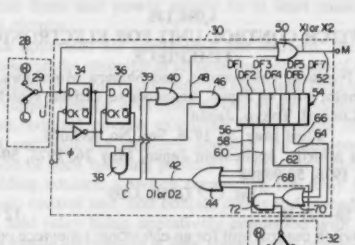
Yasushi Nomura, Tokorozawa, and Yasuhiko Nishikubo, Iruma, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Sep. 10, 1976, Ser. No. 722,242

Claims priority, application Japan, Sep. 12, 1975, 50-110649; Oct. 21, 1975, 50-142541[U]; Oct. 28, 1975, 50-146070[U]

Int. Cl.² G04B *19/30*

U.S. Cl. 58—50 R **6 Claims**



1. In an electronic timepiece having a frequency standard, a frequency converter connected to the frequency standard, a time counter providing a time information signal in response to a low frequency signal from the frequency converter, a decoder providing decoded outputs in response to the time information signal, an electro-optical display device responsive to the decoded outputs to provide a display of time information, and a switching gate coupled between the decoder and the electro-optical display device and normally assuming a first state to inhibit the supply of said decoded outputs to said electro-optical display device and operative to assume a second state to allow the supply of said decoded outputs of said electro-optical display device to cause said display device to display said time information, the improvement comprising:

a first external control switch to provide an output signal when actuated;

a second external control switch to provide a control signal when actuated; and

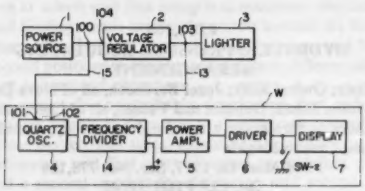
a display control circuit responsive to said output signal to render said switching gate to assume its second state for thereby causing said electro-optical display device to display said time information, said display control circuit including a timer circuit composed of a first section of flip-flops for setting a predetermined length of time in response to said output signal generated upon actuation of said first external control switch and a second section of flip-flops coupled to said first section of flip-flops, first gate means having first inputs coupled to outputs of said flip-flops of said first section and a second input coupled to outputs of the flip-flops of said second section, and second gate means coupled between the outputs of the flip-flops of said second section and said second input of said first gate means, said second gate means responsive to said control signal for passing the outputs of the flip-flops of said second section to the second input of said first gate means which consequently produces an output for a time interval in addition to said predetermined length of time.

4,094,140

TIMEPIECE-GAS LIGHTER ASSEMBLY

Hideki Ohue, 3-6-13, Kitaurawa, Urawa-shi, Saitama-ken, and Masatoshi Katayama, 1-650, Higashiohnari, Ohmiya-shi, Saitama-ken, both of Japan

Filed Aug. 24, 1976, Ser. No. 717,342
Int. Cl.² G04B *37/12*
U.S. Cl. 58—152 R **6 Claims**



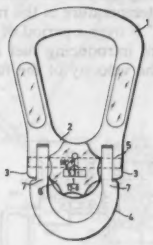
1. A unitary electronic digital display watch and liquefied gas-fueled lighter comprising a casing, a watch module mounted within said casing comprising a quartz oscillator, a digital display means for displaying a digital output, and circuit means for interconnecting said quartz oscillator with said digital display means for providing a readout representing the time, a d.c. power source connected to said watch module, and a first switch means connected to said watch module for interconnecting said power source with said watch module, a blocking oscillator, a second switch means for interconnecting said d.c. power source to said blocking oscillator, a step-up transformer having a primary winding and a secondary winding, said primary winding provided at the output of said blocking oscillator, said secondary winding connected to a spark-gap ignition circuit, said spark-gap ignition circuit comprising a pair of electrodes spaced apart to form a spark-gap, means for amplifying a pulse output across said secondary winding to a high-voltage pulse across said spark-gap of sufficient magnitude to ignite an ignitable gas appearing across said spark-gap, means for providing an ignitable gas across said spark-gap, diode means connected between said secondary winding and said pair of electrodes for preventing said high-voltage pulse from passing to said quartz oscillator, and means for positioning said digital display means and said spark-gap in said casing such that the light emitted by the ignited gas across said spark-gap is applied to said digital display means for providing a visual readout of said digital display means.

4,094,141

TERMINAL CHAIN LINK WITH BUILT-IN INDICATOR

Friedhelm Rehbein, Ober-Oesbern, Germany, assignor to August Thiele, Kalthof, Germany

Continuation of Ser. No. 592,047, Jun. 30, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,469
Claims priority, application Germany, Mar. 12, 1974, 2411725
Int. Cl.² F16G *15/04*
U.S. Cl. 59—93 **10 Claims**



1. A terminal chain link with built-in indicator, comprising a link body having two arm portions each formed with a recess and having an end section, and a brace portion of one-piece with said arm portions and extending between said end sections of the latter, said link body having an interior passage extending through said arm portions and said brace portion, said link body also having a polygonal shield portion having equiangularly spaced vertices and inwardly curved edge portions intermediate said vertices, said shield portion being of one-piece with said brace portion of said link body and having opposite sides which lie along a plane in which said arm portions lie and bear information as to load factor and other analogous information, said shield portion having a transverse dimension in direction normally of the plane exceeding that of said end sections of said arm portions and that of said brace portion so as to both reinforce the link body in the region of said brace portion weakened by said passage, and also make the load-bearing characteristic of the chain link readily determinable whereby the one-piece construction of said arm portions, said brace portion and said shield portion strengthens the chain link; a shackle having spaced end portions each insertable into a respective one of said recesses and each having an interior bore which registers with said passage upon insertion of said end portions into said recesses; and a bolt extending through said registering bores and passage for pivotally connecting said shackle with said link body for movement in a path which is remote from said shield portion so as to prevent mechanical interference with the latter during pivoting movement of said shackle.

4,094,142

TURBINE SYSTEM METHOD AND APPARATUS

William C. Pfefferle, Middletown, N.J., assignor to Engelhard Minerals & Chemicals Corp., Iselin, N.J.

Continuation of Ser. No. 519,289, Oct. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 227,420, Feb. 18, 1972, abandoned. This application Sep. 20, 1976, Ser. No. 724,654
Int. Cl.² F02C *7/22*
U.S. Cl. 60—39.03 **8 Claims**

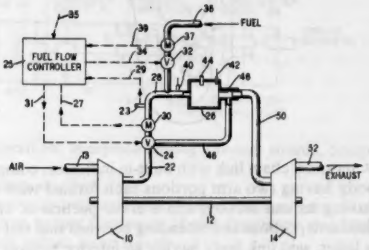
2. A method for operating a gas turbine by combusting, over a period of operation of said turbine during which variations occur in the fuel demand or in the combustion air temperature, carbonaceous fuel which when burned with a stoichiometric amount of air has an adiabatic flame temperature above about 3,300° F, comprising:

(a) forming an intimate admixture of said fuel and said combustion air, while controlling the ratio of said fuel to said combustion air in said admixture to maintain the adiabatic

flame temperature of said admixture, despite said variations, at about a preselected value in the range of about 2,500° to about 3,300° F;

(b) introducing said admixture into a combustion zone wherein combustion is proceeding under essentially adiabatic conditions with formation of combustion products in the combustion zone;

(c) mixing said fuel-air admixture with combustion products so formed to bring said admixture above its instantaneous auto-ignition temperature within said combustion zone, thereby combusting the fuel-air admixture at an approximately constant temperature in the range of about 2,500° F to about 3,300° F over a period of turbine operation in which the rate of introducing fuel into the combustion zone is varied, the velocity of the fuel-air admixture for



combustion being above the maximum flame-propagating velocity of the admixture at or upstream of the inlet to the combustion zone;

(d) simultaneously removing combustion products from said combustion zone;

(e) combining a sufficient amount of cooler, additional air with the combustion products so removed to provide a combined gas at a substantially lower temperature, wherein the temperature of the combined gas is maintained essentially constant at a temperature within the range of about 1,100° to about

2,700° F over a period of turbine operation in which the amount of fuel introduced into the combustion zone is varied; and

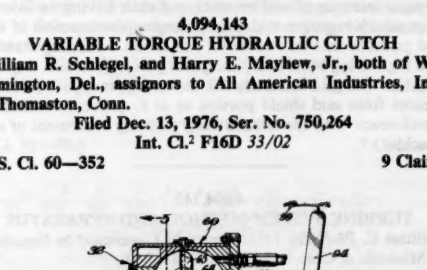
(f) passing the combined gas to a turbine as a motive fluid.

4,094,143

VARIABLE TORQUE HYDRAULIC CLUTCH

William R. Schlegel, and Harry E. Mayhew, Jr., both of Wilmington, Del., assignors to All American Industries, Inc., Thomaston, Conn.

Filed Dec. 13, 1976, Ser. No. 750,264
Int. Cl.[2] F16D *33/02*
U.S. Cl. 60—352 **9 Claims**



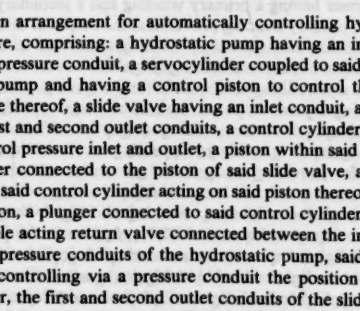
1. A variable torque hydraulic radially comprising a casing having a toroidal cavity and an inner wall containing a liquid, a rotatable input shaft mounted upon the casing, an input rotor blade ring disposed within the casing and connected to the input shaft, a rotatable output shaft mounted on the casing, an output rotor blade ring disposed within the casing peripherally adjacent the input rotor blade ring and connected to the output shaft whereby the output rotor ring is caused to rotate in response to rotation of the input rotor ring, the input and output rotor blade rings each including an annular array of substantially rdially disposed rotor blades, a toroidal flow-control ring disposed in the casing which is separated from the inner wall by a surrounding space having short and long circumferences, the flow-control ring being disposed adjacent the sides of the rotor blade rings whereby liquid flowing through them is circulated within the casing in directions parallel to the shorter circumference of the space surrounding the flow-control ring and back through the rotor blade rings, an annular recess in the flow-control ring adjacent one of the rotor blade rings, an annular blocking plate means constructed and arranged to be capable of closing off the flow through one of the rotor blade rings, translating means connected to the annular blocking plate means for moving it from a position in the annular recess withdrawn from the liquid circulating through the rotor blade rings to a position disposed outside the annular recess which blocks the flow of liquid from circulating through one of the rotor blade rings whereby the force transmitted through the clutch is varied, and the annular blocking plate means comprises an annular channel having a pair of legs which are disposed on both sides of the blades on one of the annular rotor rings to block off flow through the blades.

4,094,144

HYDRAULIC PRESSURE REGULATING ARRANGEMENT

Pavel Italy; Ondrej Kilik; Jozef Barancok, all of Nova Dubnica, and Anton Miski, Dubnica nad Vahom, all of Czechoslovakia, assignors to Strojarske a metalurgicke zavody, Dubnica nad Vahom, Czechoslovakia

Filed Mar. 16, 1977, Ser. No. 778,136
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—445 **6 Claims**

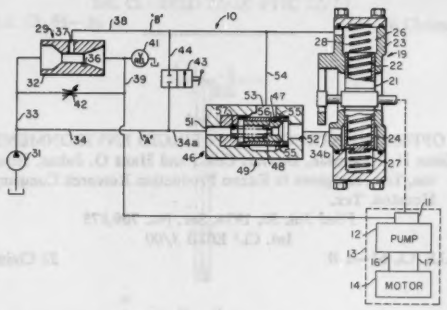


1. An arrangement for automatically controlling hydraulic pressure, comprising: a hydrostatic pump having an inlet and outlet pressure conduit, a servocylinder coupled to said hydrostatic pump and having a control piston to control the fluid volume thereof, a slide valve having an inlet conduit, a piston, and first and second outlet conduits, a control cylinder having a control pressure inlet and outlet, a piston within said control cylinder connected to the piston of said slide valve, a spring within said control cylinder acting on said piston thereof in one direction, a plunger connected to said control cylinder piston, a double acting return valve connected between the inlet and outlet pressure conduits of the hydrostatic pump, said return valve controlling via a pressure conduit the position of said plunger, the first and second outlet conduits of the slide valve being connected to the servocylinder of the hydrostatic pump.

4,094,145
UNDERSPEED ACTUATOR FOR A HYDROSTATIC TRANSMISSION HAVING A SHUNT VALVE

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 16, 1977, Ser. No. 807,277
Int. Cl.[2] F16H *39/46*
U.S. Cl. 60—447 4 Claims



1. In a control system for controlling the displacement of a first pump driven by a prime mover, comprising:

control means for adjusting the displacement of said first pump;

an underspeed actuator having a piston, first and second actuating chambers at opposite ends of said piston, and a biasing means, said piston being connected to the control means and movable between a first position at which said first pump is at minimum displacement and a second position at which said first pump is at maximum displacement, said biasing means urging the piston toward the first position and said piston being movable between said first and second positions in response to pressure differential in said first and second chambers;

signal means for controllably developing first and second control signals in response to the operating speed of the prime mover, said signal means having a first conduit for delivering said first control signal to said first chamber and a second conduit for delivering said second control signal to said second chamber; and

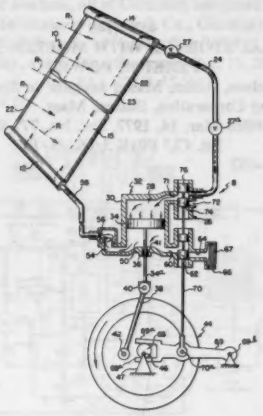
shunt valve means connected to the first and second conduits for passing fluid expelled from the first chamber to the second chamber in response to said flow of fluid expelled from the first chamber exceeding a preselected flow rate.

4,094,146
SOLAR ENGINE

Earl O. Schweitzer, 29353 Luxona Rd., Wickliffe, Ohio 44092

Filed May 7, 1976, Ser. No. 684,115
Int. Cl.[2] F03G *7/02;* F02C *1/04*
U.S. Cl. 60—641 6 Claims

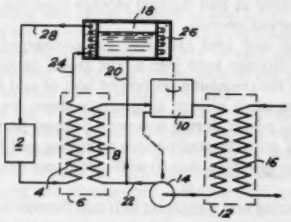
1. A solar engine comprising a thin-walled pressure vessel capable of containing and heating air by means of solar energy, and a diaphragm air motor connected to said vessel and adapted to be driven by a mass of heated air from said vessel, said air motor including a housing defining a chamber having a movable diaphragm therein dividing said chamber into spaced chamber portions, one of said portions comprising air pump means adapted for pumping a substantially equal mass of cool air into said vessel as compared to the first mentioned mass of heated air, said air motor having excess power output means capable of doing work, and including check valve means on the output side of said pump means and the intake side of said vessel, for preventing reverse flow of air from said intake side in a direction toward said pump means, said diaphragm being secured adjacent its periphery to said housing, and including a generally central head portion to which a rod is secured, said rod extending exteriorly of said housing, and adapted for coupling to means for doing work, the central sections of the interior surface of said housing that are disposed in confronting relation to said head portion being of a configuration to generally snugly receive said head portion in generally engaged relation in the respective maximum stroke positions of said rod and attached head portion, the interior surface sections of said housing laterally of said central sections being generally convex, and engaging the portions of said diaphragm outwardly from said head portion in generally surface-to-surface relation in said respective maximum stroke positions of said rod and attached head portion, for increasing the efficiency of said engine.



4,094,147
CIRCUIT FOR THE SUPPLY OF CONDENSABLE FLUID TO A SOLAR ENGINE

Thierry Alleau, Saint-Ismier, and Robert Moracchioli, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 8, 1977, Ser. No. 775,476
Claims priority, application France, Mar. 11, 1976, 76 07005
Int. Cl.[2] F03G *7/02;* F01K *3/00*
U.S. Cl. 60—641 3 Claims



1. An improved circuit for the supply of a condensable fluid to a solar engine comprising a primary circuit in which a first liquid is circulated, and comprising at least one solar collector and an evaporator having primary and secondary portions and a secondary circuit in which a condensable fluid is circulated, said secondary circuit including the secondary portion of said evaporator, an oulet for said evaporator supplying a solar engine coupled with a condenser, an oulet for said condenser connected by a re-supply pump to an inlet of said secondary portion of said evaporator, said re-supply pump being coupled with said engine, wherein said secondary circuit comprises a

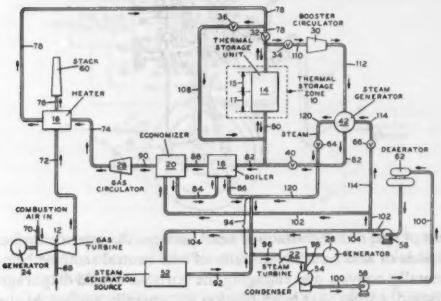
start-up storage tank located at a higher level than said evaporator and connected by a pipe to said secondary circuit at a point in said secondary circuit between said engine and said pump and including said secondary portion of said evaporator, and regulating means for said storage tank for bringing the fluid therein to a temperature lower than the temperature of the condensable fluid within said evaporator.

4,094,148

THERMAL STORAGE WITH MOLTEN SALT FOR PEAKING POWER

Hazen E. Nelson, Acton, Mass., assignor to Stone & Webster Engineering Corporation, Boston, Mass.

Filed Mar. 14, 1977, Ser. No. 777,458
Int. Cl.[2] F01K *3/00, 23/10*
U.S. Cl. 60—652 **13 Claims**



1. In a process for the generation of electrical power wherein coil is gasified and these gases are burned to produce a stream of heated fuel gases which are introduced into an electrical power generation zone to generate electrical power during peak and non-peak electrical power demand periods and wherein heated exhaust gases are released from said electrical power generation zone, the improvement which utilizes the heat released by said exhaust gases to generate increased electrical power during peak demand periods comprising:

(i) passing a heat exchange gas in contact with said heated exhaust gases to heat said heat exchange gas with heat released by said exhaust gases;

(ii) introducing said heated heat exchange gas into a thermal storage zone wherein during non-peak demand periods a portion of the heat released by said heated heat exchange gas is stored in said thermal storage zone for use during peak demand periods;

(iii) passing said heat exchange gas discharged from said thermal storage zone into a first steam generation zone wherein the remaining portion of heat of said heated heat exchange gas is utilized to generate steam for producing electrical power during non-peak demand periods;

(iv) during peak demand periods admixing said heated heat exchange gas from step (i) with additional heat exchange gas;

(v) introducing said admixture into said thermal storage zone to heat said admixture with the heat stored in said thermal storage zone;

(vi) passing the heated admixture discharged from said thermal storage zone into a second steam generation zone wherein the heat of said admixture is utilized to generate steam for producing increased electrical power during peak demand periods;

(vii) recirculating a portion of the admixture discharged from said second steam generation zone back into said thermal storage zone to heat said recirculated admixture with the heat stored in said thermal storage zone;

(viii) directing the remaining portion of the admixture discharged from said second steam generation zone into said first steam generation zone to generate steam for producing electrical power;

(ix) heating the admixture discharged from said first steam generation zone with said exhaust gases; and

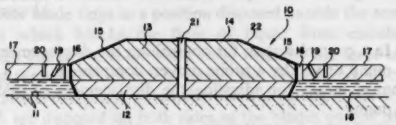
(x) admixing said recirculating portion of admixture of step (vii) with said heated admixture of step (ix) and introducing same into said thermal storage zone.

4,094,149

OFFSHORE STRUCTURE IN FRIGID ENVIRONMENT

Gene D. Thompson, Denver, Colo., and Hans O. Jahns, Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jul. 30, 1976, Ser. No. 709,975
Int. Cl.[2] E02B *3/00*
U.S. Cl. 61—1 R **22 Claims**



1. A method for constructing a structure in an arctic offshore environment comprising:

forming an artificial ice island extending from the sea floor to above the surface of the water; and

installing a caisson entirely through said island to below said sea floor, said caisson being formed in two parts, one part extending through said island to said sea floor and the other part extending from said sea floor to below said sea floor, said caisson being separable at said sea floor upon movement of said island.

4,094,150

COMPOSITION OF MATTER USEFUL FOR EARTHEN FORMATION TREATMENT

William J. Clarke, Ridgewood, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,355
Int. Cl.[2] C08L *35/00*
U.S. Cl. 61—36 C **7 Claims**

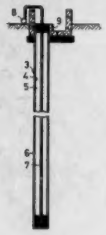
1. A method for treating earth formations around the joints of underground pipes and concrete foundations comprising injecting into the earth formation a gel-forming composition comprising an aqueous solution containing from about 5% to about 20%, by weight, based on the total weight of the solution of a mixture of (A) from about 80% to 99.5%, by weight, of monomeric acrylamide and correspondingly (B) from about 20% to 0.5% by weight of monomeric N,N'-methylenebisacrylamide wherein the percentages by weight of said monomers total 100%, and (C) from about 4% to 20%, by weight, of an unfired natural diatomaceous earth, 80% of which has a particle size between about 2μ and 10μ the percentage by weight of said diatomaceous earth being based on the total weight of the solution and (D) an effective amount of a polymerization catalyst, whereby fluid loss from the gelled composition into the earth formations is substantially reduced.

4,094,151

ANTI-FREEZING METHOD AND APPARATUS FOR GROUND SURROUNDING LIQUIFIED GAS STORING UNDERGROUND TANK

Hiroshi Fujita, Tokyo; Munetaka Kubota, Hino; Takashi Makita, Yokosuka, and Yukishige Takahashi, Mitaka, all of Japan, assignors to Kajima Kensetsu Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1977, Ser. No. 788,960
Int. Cl.[2] E02D *27/38*; F17C *13/10*
U.S. Cl. 61—36 A 6 Claims



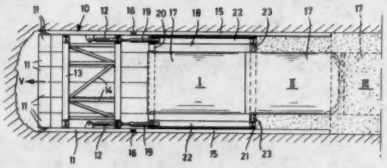
1. Apparatus for warming ground about an underground cryogenic storage tank comprising: a vertically disposed water impermeable envelope embedded in the ground adjacent to said tank, said envelope being filled with granular material; a source of water for said envelope; water conveying means in said envelope extending from the upper to the lower portion of said envelope; said water conveying means being in communication at its lower end with the interior of said envelope and being in communication at its upper end with water impelling means adapted to move water through said envelope; and means to dispose of excess water from said envelope.

4,094,152

APPARATUS FOR LAYING A PIPE LINE

Hans Jütte, Dortmund-Brechten, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Apr. 27, 1977, Ser. No. 791,487
Claims priority, application Germany, May 21, 1976, 2622671
Int. Cl.[2] E21D *5/12*
U.S. Cl. 61—41 A 7 Claims



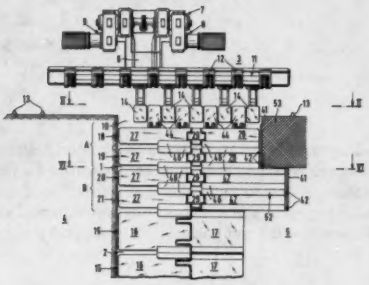
1. An apparatus for use in laying a pipe line composed of individual pipe sections arranged end-to-end; said apparatus comprising an advanceable shield for excavating an open trench and for supporting the walls thereof, said shield being composed of a plurality of longitudinally displaceable elongate drive members, frame means for supporting and guiding the drive members and ram means for effecting relative movement between the frame means and the drive members to effect advancement of the trench, supplementary elongate members connected to the drive members for supporting the trench walls rearwardly of the shield, an open frame supporting the supplementary members and serving to receive the individual pipe sections and adjustable means for connecting said open frame to the frame means and for effecting relative displacement therebetween, wherein the length of the supplementary members is substantially greater than the length of the open frame so as to extend rearwardly thereof and the length of the supplementary members is at least twice the length of one of the pipe sections.

4,094,153

BREAST ROOF SUPPORT SYSTEM FOR LONGWALL MINING

Günter Blumenthal, Westerhold; Karlheinz Bohnes, and Peter Marr, both of Bochum, all of Germany, assignors to Bochumer Eisenhütte Heintzmann GmbH & Co., Germany

Filed Dec. 9, 1976, Ser. No. 748,911
Claims priority, application Germany, Oct. 15, 1976, 2646563
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D 11 Claims



1. A prop system for supporting the roof of a breast extending laterally from a mine and having a face side at a working area and a stowage side at a stowage area, said system comprising:

at least three similar props one of which is relatively close to said mine, one of which is relatively far from said mine, and one of which is flanked by the other two props, said props each including

a lower floor-engaging part elongated longitudinally generally parallel to said mine,

a roof-engaging upper part extending generally parallel to the respective lower part and having a pair of opposite ends extending longitudinally past the respective lower part, and

means for displacing each upper part vertically relative to the respective lower part;

means extending longitudinally between adjacent props for displacing each prop longitudinally generally parallel to said mine relative to the other props for stepping of said props along said breast parallel to said mine;

an upright and transversely extending solid shield on each of said props extending transversely to said mine between the respective upper and lower parts at the ends thereof turned toward said stowage side; and

an upright and longitudinally extending solid shield extending longitudinally generally parallel to said mine between the upper and lower parts of the prop furthest from said mine, said transverse and longitudinal shields together partitoning said stowage area off from said working area.

4,094,154

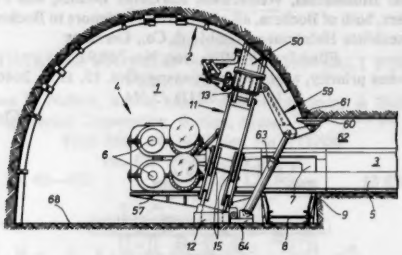
ROOF PROP APPARATUS AND METHOD FOR LONGWALL MINING

Gunter Blumenthal, Westerholt; Karlheinz Bohnes, and Peter Marr, both of Bochum, all of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co., Bochum, Germany

Filed Dec. 9, 1976, Ser. No. 748,912
Claims priority, application Germany, Oct. 15, 1976, 2646562
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D 19 Claims

1. A roof-propping apparatus for longwall mining wherein the mine roof is supported by a succession of arches each in

turn supported at one mine wall by a respective leg, said apparatus comprising: a pair of similar frames each having an elongated upper part juxtaposable with said arches and a lower part supported on the mine floor, said upper parts extending parallel next to each other; a plurality of discrete holders each engageable between said upper parts and said arches; means for



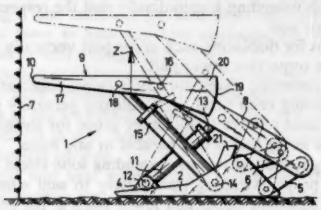
expanding said holders and bracing said holders between either of said upper parts and respective arches; means for displacing said frames relative to each other in the direction of elongation of said upper parts; and a support platform mounted on one of said frames adapted and constructed to support mining equipment.

4,094,155

MINE ROOF SUPPORT

Günter Blumenthal, Westerholt; Gustav Neu, Bochum, and Hans-Ferdinand Bemmerl, Hern, all of Germany, assignors to Bochumer Eisenhutte Heintzmann GmbH & Co., Bochum, Germany

Filed Jan. 21, 1977, Ser. No. 760,949
Claims priority, application Germany, Feb. 3, 1976, 2603953
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **18 Claims**



1. A mine roof support for an underground mine gallery comprising elongated sole plate means integral in the longitudinal direction thereof and adapted to engage the floor of a mine gallery; a rear shield having a lower and an upper end; link means connecting said rear shield in the region of the lower end thereof to said sole plate means; a roof shield having a front end adapted to be directed towards the face of the mine gallery and an opposite rear end; pivot means connecting said roof shield intermediate the ends thereof to the upper end of said rear shield, with a portion of said roof shield between said pivot means and said front end thereof considerably longer than the portion between said pivot means and the opposite rear end of said roof shield; at least one extensible and collapsible prop means between said sole plate means and the portion of said roof shield means which is located forwardly of said pivot means; and at least one additional extensible and collapsible prop means between said sole plate means and said rear shield means.

4,094,156

METHOD AND APPARATUS FOR DRIVING SHEET PILES INTO THE GROUND

Fritz Dumont, Dortmund-Persebeck, Germany, assignor to Baugesellschaft Klammt KG, Hagen, Germany

Filed Mar. 6, 1974, Ser. No. 448,764
Claims priority, application Germany, Mar. 10, 1973, 2312032; Feb. 9, 1974, 2406283
Int. Cl.² E02D *7/26*
U.S. Cl. 61—53.5 **14 Claims**

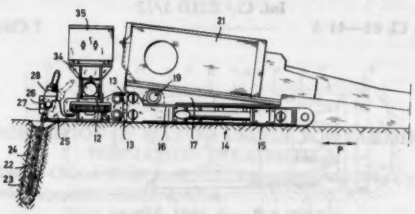
1. A method of driving a sheet pile into the ground comprising driving a sheet pile into the ground and boring a hole adjacent said sheet pile, at least one part of the boring step being performed at a time when the pile is already in a partially driven-in state, said hole being of such distance from the pile as to provide at least partial space for the soil displaced by the pile.

4,094,157

ANCHORING APPARATUS FOR ANCHORING A MINING INSTALLATION

Werner Karsten, Gelsenkirchen, and Helmut Erwien, Lunen, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Germany

Filed Dec. 3, 1976, Ser. No. 747,434
Claims priority, application Germany, Dec. 5, 1975, 2554690
Int. Cl.² E21D *20/00, 21/02*
U.S. Cl. 61—63 **14 Claims**

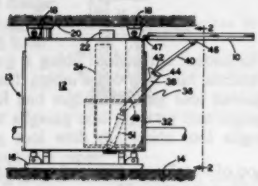


1. Anchoring apparatus for anchoring a mining installation to the floor of a mining excavation, said apparatus comprising:
(a) an anchor beam;
(b) an anchoring element for anchoring in a borehole in said mining excavation floor; and
(c) a tensioning device for prestressing the anchoring element, said tensioning device comprising:
(i) a pivot bearing rigidly attached to said beam;
(ii) a support member pivotally mounted in said pivot bearing which permits pivoting of the support member about an axis parallel to the longitudinal axis of said anchor beam;
(iii) a connection member connected to said anchoring element; and
(iv) adjustment means for adjusting the position of said connection member with respect to said support member.

4,094,158
LOADING GATE FOR MINE ROOF BOLTER APPARATUS

Richard W. LeVere; Joseph M. Vocaturo, both of Trenton, and James L. Finney, Cranbury, all of N.J., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed May 27, 1977, Ser. No. 801,269
Int. Cl.[2] E21C *11/02*
U.S. Cl. 61—63 **13 Claims**



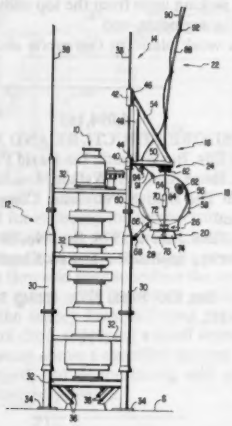
1. In combination with a mine roof bolter apparatus having an access opening in an end wall thereof for loading and unloading said apparatus, a door forming a protective canopy attached to said apparatus above said access opening for protective of personnel loading or unloading said apparatus; said door when in a closed position extending substantially the entire length of the access opening; and

means engaging said mine roof and floor for fixedly mounting the mine roof bolter apparatus therebetween.

4,094,159
SUBMERSIBLE CHAMBER

Frederic L. Hettinger, Jupiter, Fla., assignor to Perry Oceanographics, Inc., Riviera Beach, Fla.

Filed Jun. 10, 1976, Ser. No. 694,833
Int. Cl.[2] B63C *11/40*
U.S. Cl. 61—69 R **9 Claims**



1. Diving apparatus comprising:

(a) a guide member system extending from a location at the seabed where work is to be performed and the sea surface and including member disposed laterally of the work location;

(b) a normally negatively buoyant bell assembly including a positively buoyant bell and a negatively buoyant ballast weight removably connected thereto;

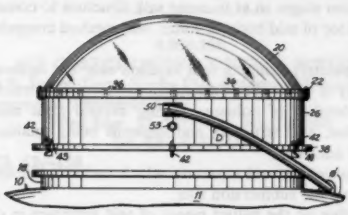
(c) sliding frame means movable vertically along said guide member system beneath the sea surface between an upper position at the sea surface and a lower position sufficiently above the subsea surface to permit vertical movement of the bell assembly to the vicinity of the work location, the frame means being temporarily stationary at said lower position by abutment with a portion of said guide member system; and

(d) bell assembly moving means connected between said bell assembly and said frame means for moving said bell assembly between a lower position adjacent the subsea surface work location and an upper position adjacent said frame means when the latter is in its lower position.

4,094,160
DIVING BELL WITH TRANSPARENT DOOR FOR PANORAMIC VIEWING

Andre Galerne, Larchmont, N.Y., assignor to International Underwater Contractors, Inc., Bronx, N.Y.

Filed May 9, 1977, Ser. No. 795,112
Int. Cl.[2] E05C *1/00*
U.S. Cl. 61—69 R **3 Claims**



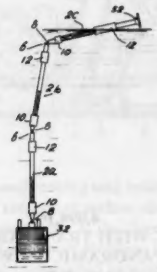
1. In a diving bell having a hollow frame in which is defined a cut-out portion; an improvement comprising a transparent closure adapted for being positioned in front of said cut-out portion and moveable between an opened position and a closed position; and means mounting said transparent closure in front of said cut-out portion so that said transparent closure is in alignment with said cut-out portion when said transparent closure is in its closed position, whereby panoramic observations may be made from within the bell; said transparent closure comprising a transparent, hemispherical portion having a circular end portion; a hollow cylindrical extension having a first end for supporting said circular end portion of said hemispherical portion thereon, and a second end spaced from said first end; and means mounting said circular end portion of said hemispherical portion on said first end of said hollow cylindrical extension; said means mounting said circular end portion on said first end comprising: a flange positioned about said first end of said hollow cylindrical extension, said flange and circular end portion of said hemispherical portion each having a canted surface of the same angle; and an annular ring positioned on said flange in a direction away from said second end of said hollow cylindrical extension, said annular ring having a canted surface that is perpendicular to the canted surface of said flange, said annular ring engaging said hemispherical portion adjacent said circular end portion, whereby the canted surfaces of said flange and said annular ring hold said circular end portion of said hemispherical portion so that said hemispherical portion is supported therein.

4,094,161

SUBMERGED APPARATUS AND METHOD FOR SUBMERSING THE SAME

Michel Moinard, Bizanos; Michel Leturcq, Rueil Malmaison, and Catherine Delcroix, Puteaux, all of France, assignors to Societe Nationale Elf Aquitaine, Paris, France

Filed May 7, 1976, Ser. No. 684,086
Claims priority, application France, May 7, 1975, 75 14447
Int. Cl.[2] E02D *23/02*
U.S. Cl. 61—95 10 Claims



1. A method for submersing and positioning a structure in a body of water through a series of separate and consecutive submersion stages so as to cause said structure to come to rest on the floor of said body of water, said method comprising the steps of:

(a) separately bringing to a location near the surface of the body of water above the submersion site said structure and a plurality of columns having several float means for ballast, said structure and columns being unattached to one another;

(b) positioning said structure which includes ballast means above the submersion site;

(c) acting on the ballast means of said structure in order to submerge said structure until its top is near the surface of the body of water and the apparent weight of said structure is reduced to about zero;

(d) pivotally attaching the top of said submerged structure to one end of a first of said plurality of columns;

(e) acting on the float means of said first column for pivotally displacing said attached one end of said first column downward until the column is brought into a vertical, submerged position in the water with the other end of said first column being close to the surface of the body of water, said structure being further submerged vertically downward at the submersion site by the pivotal displacement of said first column;

(f) pivotally attaching said other end of the first submerged column near the surface of the water to one end of a second column;

(g) acting on the float means of said second column for pivotally displacing said attached one end of said second column downward until the second column is brought into a vertical, submerged position in the water with the other end of said second column being close to the surface of the body of water, said structure and said first column being further submerged vertically downward at the submersion site by the pivotal displacement of said second column; and

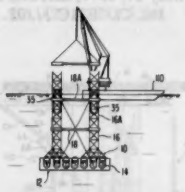
(h) maintaining the pressure within said structure at a value substantially equal to the pressure of the water surrounding said structure during each successive submersion stage.

4,094,162

METHOD FOR INSTALLING AN OFFSHORE TOWER

John W. Allee, Houston, Tex., assignor to Brown & Root, Inc., Houston, Tex.

Filed Jun. 21, 1977, Ser. No. 808,520
Int. Cl.[2] E02B *17/00*
U.S. Cl. 61—96 6 Claims



1. A method of installing a tower at a worksite in a body of water, comprising the steps of:

floating to the worksite a tower subassembly comprising a base, a plurality of upright, open-trussed initial leg segments and flotation means;

floatingly disposing open-trussed add-on leg segments in the vicinity of said worksite;

ballasting said flotation means to partially immerse said subassembly so that buoyant jacking units disposed within and connected to respective ones of said initial leg segments floatingly support said subassembly, with top portions of said initial leg segments projecting above the water surface;

mounting add-on leg segments onto said leg portions projecting above the water surface;

while suspending said subassembly from said jacking units, lowering said subassembly so that said jacking units enter said add-on leg segments as said add-on leg segments pass downwardly therearound;

repeating said mounting and lowering steps until said base is supported on the floor of the body of water;

lifting said jacking units from the top ends of said uppermost add-on leg segments; and

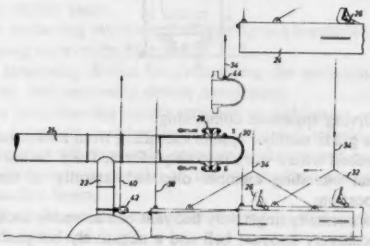
installing a work platform thereupon above the water surface.

4,094,163

OFFSHORE STRUCTURE AND METHOD

John William Ells, Bexleyheath; Ian David Parker, Basingstoke, and David Baird Langley Walker, London, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Jun. 4, 1976, Ser. No. 692,771
Claims priority, application United Kingdom, Jun. 13, 1975, 25355/75
Int. Cl.[2] F16L *1/04;* B23Q *3/00*
U.S. Cl. 61—111 8 Claims



1. A method of aligning and connecting two pipes at an

underwater location, each pipe having a flange at the terminus thereof, wherein at the commencement of the method the first pipe is supported in a stationary position beneath the surface of the water and the second pipe is positioned above the surface of the water, which method comprises:

(i) attaching an anchoring tool having a substantially flat portion to the flange of said first pipe so that the flat portion of said anchoring tool engages said flange thereby protecting said flange from damage during the connecting procedure, said anchoring tool having means for anchoring a plurality of guide wires at spaced apart locations from said flange;

(ii) anchoring a plurality of guide wires to the attached anchoring tool;

(iii) attaching a guide tool to the second of said pipes to engage said guide wires and said anchoring tool, said guide tool and said anchoring tool having cooperating means for aligning said pipes so that engagement of the anchoring tool with the guide tool aligns and axially spaces apart said pipes;

(iv) lowering said attached guide tool from above the surface of the water along said guide wires into engagement with said anchoring tool so that said pipes are aligned and axially spaced apart prior to being joined together;

(v) removing the anchoring tool and the guide tool and joining the two pipes together; and

(vi) fastening the two pipes in a fluid tight relationship.

4,094,164

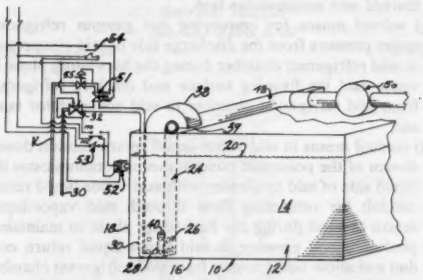
METHOD AND APPARATUS FOR REDUCING THE TEMPERATURE OF A FLUID

Louis T. Cope, Grayson, Ga., assignor to H & T Enterprises, Inc., Grayson, Ga.

Filed Feb. 18, 1976, Ser. No. 659,122

Int. Cl.[2] F25C *1/00*; F28C *1/00*; B01F *3/04*; F25D *3/12*

U.S. Cl. 62—74 **9 Claims**



1. In a method for reducing the temperature of a fluid: supplying pressurized liquid gas and releasing said gas beneath the fluid permitting same to become a moving gas within said fluid, directing said gas thru said fluid to reduce the temperature, and providing a vapor sweep cycle to prevent accidental formation of solid CO_2 in the supply lines including, in response to an unwanted pressure drop, supplying a small amount of vapor to maintain the pressure above a specified amount until all liquid has been discharged, and discontinuing said vapor upon the reaching of the desired pressure.

4,094,165

LOSS HEAT SUPPRESSION APPARATUS AND METHOD FOR HEAT PUMP

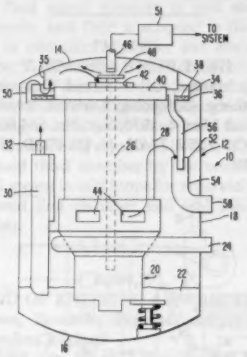
Francis J. Sisk, Apollo, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Nov. 19, 1976, Ser. No. 743,422

Int. Cl.[2] F25B *1/00*

U.S. Cl. 62—115 **12 Claims**

1. A compressor unit for a heat pump system comprising: a casing; a compressor mounted in the casing and having an inlet and a vapor outlet communicating with the interior of the casing to direct discharge vapor therinto; a motor within the casing and coupled to the compressor for driving the same, the motor having a housing provided with air gaps therethrough; means coupled with the casing for directing pressurized liquid from the system into the casing; means coupled with the directing means for spraying the liquid into the path of travel of the



discharge vapor therefrom to de-superheat the discharge vapor, the motor having an opening permitting the discharge vapor to flow thereinto and through the air gaps thereof to cool the same and to re-superheat the vapor; and means for receiving the liquid and the re-superheated vapor to cause entrainment of the liquid in the vapor for flow to the system.

4,094,166

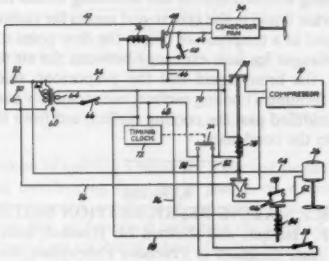
AIR CONDITIONING CONTROL SYSTEM

James B. Jerles, Tierra Verde, Fla., assignor to Electro-Thermal Corporation, Pensacola, Fla.

Filed Mar. 23, 1977, Ser. No. 780,665

Int. Cl.[2] F25B *41/00*

U.S. Cl. 62—158 **13 Claims**



1. An air conditioning system for maintaining ambient room air within a desired temperature range comprising:

a heat exchanger,

selectively activated energy transfer means for cooling said heat exchanger,

motor operated fan means for forcing a stream of air through said heat exchanger,

timer means for alternately activating said energy transfer means for a preselected first period of time and deactivating said energy transfer means for a preselected second period of time,

control means for activating and deactivating said timer means and said motor operated fan means in response to ambient room air temperatures above and below, respectively, a predetermined level and for activating and deactivating said energy transfer means during said second

timer period in response to the temperature of the air from said motor fan means on the downstream side of said heat exchanger being above and below, respectively, a predetermined level,

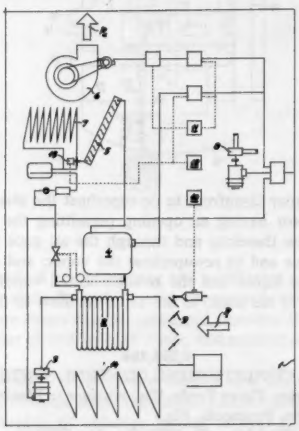
the ratio of said first and second periods remaining constant regardless of the ambient temperature responded to by said control means.

4,094,167

HEAT PUMP ASSEMBLY

Henning Brinch Madsen, Greve Strand, Denmark, assignor to Svenska Geotherm Aktiebolag, Karlstad, Sweden

Filed Mar. 4, 1976, Ser. No. 664,028
Int. Cl.[2] F25B *27/02, 13/00;* F25D *11/00*
U.S. Cl. 62—238 **4 Claims**



1. An assembly for dehumidifying air, comprising a heat pump system including a compressor, an evaporator, a condenser and a thermostatic expansion valve; a brine liquid system forming a closed system and including means for circulating the brine liquid in the system and means for maintaining the brine liquid at a temperature below the dew point of the air; a heat exchanger for heat exchange between the air to be dehumidified, the brine liquid and the evaporator, said heat exchanger forming a cooling surface; and means for passing air to be dehumidified past the cooling surface and from the cooling surface to the condenser.

4,094,168

ICE MAKING REFRIGERATION SYSTEM

George F. Hamner, and Richard M. Hamner, both of Tuscaloosa, Ala., assignors to Precision Fabricators, Inc., Albany, Ga.

Filed Jan. 26, 1977, Ser. No. 762,477
Int. Cl.[2] F25C *1/12*
U.S. Cl. 62—347 **5 Claims**

1. In an ice making refrigerating system adapted to be cycled alternately through a freezing phase and an ice harvesting phase and including a compressor, a condenser and an evaporator having a closed refrigerant chamber with an ice forming surface thereon for applying a substance to be frozen during the freezing phase,

(a) an accumulator tank above and externally of said refrigerant chamber,

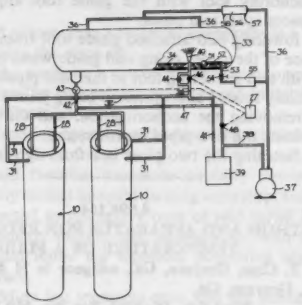
(b) valve means communicating said accumulator tank with said refrigerant chamber and disposed to deliver liquid refrigerant by gravity flow to said refrigerant chamber during the freezing phase,

(c) a suction conduit communicating the upper portion of said accumulator tank with the suction side of said compressor for separating liquid from vapor and returning vaporized refrigerant to said compressor,

(d) a vapor-liquid return conduit communicating an upper portion of said refrigerant chamber with said accumulator tank and disposed to convey vaporized refrigerant and liquid refrigerant from said refrigerant chamber to said accumulator tank,

(e) conduit means communicating the discharge side of said compressor with said condenser,

(f) conduit means communicating the liquid side of said condenser with said vapor-liquid return conduit downstream of said refrigerant chamber so that high pressure makeup liquid replaces the liquid evaporated in the refrigeration process and is delivered from the condenser to said vapor-liquid return conduit in the general direction of flow of refrigerant therethrough to form a mixture of said liquid delivered from the condenser and said vaporized



refrigerant and liquid refrigerant delivered from said refrigerant chamber and to aid in conveying said mixture toward said accumulator tank,

(g) valved means for conveying hot gaseous refrigerant under pressure from the discharge side of said compressor to said refrigerant chamber during the harvesting phase to warm said ice forming surface and displace refrigerant from said refrigerant chamber to said accumulator tank; and

(h) control means in said vapor-liquid return conduit downstream of the point said conduit means communicates the liquid side of said condenser with said vapor-liquid return conduit for restricting flow through said vapor-liquid return conduit during the harvesting phase to maintain a predetermined pressure in said vapor-liquid return conduit and allow liquid to pass from said refrigerant chamber to said accumulator tank when a predetermined pressure is reached in said vapor-liquid return conduit.

4,094,169

EXPANDER-COMPRESSOR TRANSDUCER

Lawrence Jay Schmerzler, 539 Laurel Pl., South Orange, N.J. 07079

Continuation of Ser. No. 59,306, Jul. 29, 1970, abandoned. This application Nov. 21, 1973, Ser. No. 417,958
Int. Cl.[2] F25B *1/02;* F04B *17/00*
U.S. Cl. 62—498 **2 Claims**

1. An expander-compressor transducer for expanding refrigerant fluid from a high pressure source into a low pressure heat absorbing heat exchanger while simultaneously precompressing the same fluid stream drived from the low pressure heat absorbing heat exhanger for delivery through suitable conduit heat exchangers to the suction side of the high pressure source, comprising

a body member enclosing a chamber for confinement of a refrigerant fluid.

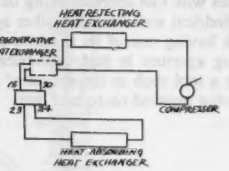
fluid responsive piston means arranged to oscillate in said chamber and dividing said chamber into an expansion

chamber at one end and a compression chamber at the other end,

return spring control means in said compression chamber for locating said piston means into initial start-up position,

fluid control regulating means for permitting flow of refrigerant fluid into and out of said expansion chamber and into said compression chamber, and

check valve means for permitting refrigerant flow out of said



compression chamber whenever the pressure in said compression chamber is higher than the fluid pressure immediately downstream of said check valve means.

thereby effecting oscillatory movement of said fluid responsive piston means within said chamber, causing concurrently the refrigerant fluid stream to expand in said expansion chamber and to compress in said compression chamber, and producing simultaneously a cooling effect and a work output.

4,094,170

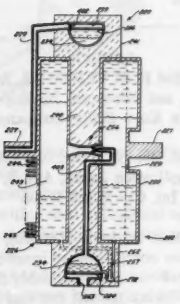
ROTARY THERMODYNAMIC APPARATUS

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Division of Ser. No. 461,452, Apr. 16, 1974, Pat. No. 3,981,627, which is a division of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828, which is a continuation-in-part of Ser. No. 608,323, Jan. 10, 1967, Pat. No. 3,470,704. This application Sep. 16, 1976, Ser. No. 723,733

Int. Cl.² F25B 3/00

U.S. Cl. 62—499 **8 Claims**



1. A thermodynamic apparatus comprising a rotor, means for rotating said rotor, conduit means in said rotor having a pair of closed working fluid flow loops, one of said loops having a first heat transfer chamber, the other of said loops having a second heat transfer chamber, said conduit means including a third heat transfer chamber forming a common section for each of said loops, said loops sharing a common flow point at a location situated radially outwardly from the largest radial location of any free liquid surface in any of said chambers, means for removing heat from said third chamber, and means in said conduit for creating a difference in fluid vapor pressure in said second and third chambers whereby said fluid is adapted to discharge heat by condensation in said third chamber and absorb heat in said second chamber.

8. A thermodynamic apparatus comprising, a rotor, means for rotating said rotor, conduit means in said rotor having a pair of closed working fluid flow loops, one of said loops having a first heat transfer chamber, the other of said loops having a second heat transfer chamber, said conduit means including a third heat transfer chamber forming a common section for each of said loops, means for removing heat from said third chamber, and means in said conduit for creating a difference in fluid vapor pressure in said second and third chambers whereby said fluid is adapted to discharge heat by condensation in said third chamber and absorb heat in said second chamber; said working fluid comprising a pair of immiscible fluids, one of said fluids flowing through said one loop and the other of said fluids flowing through said other of said loops and having a density different from the density of said one fluid, said fluids being separated in their liquid forms at the periphery of said third chamber by the centrifugal effects of said rotor, and means in said loops for separately returning said one fluid to said first chamber and said other fluid to said second chamber.

4,094,171

METHOD OF KNITTING A SWEATER BLANK

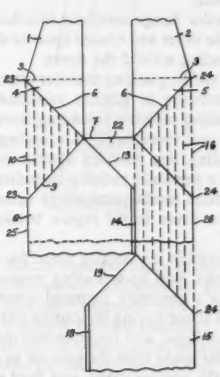
Frank Robinson, Breaston, England, assignor to Courtaulds Limited, London, England

Filed Aug. 19, 1977, Ser. No. 825,972

Claims priority, application United Kingdom, Aug. 24, 1976, 35155/76

Int. Cl.² A41B 9/06

U.S. Cl. 66—176 **3 Claims**



1. A method of knitting a blank for a sleeved jacket or cardigan having overlapping front body panels, on a knitting machine with opposed needle beds containing independently operable needles, said method including the steps of

(a) knitting a set of sleeve fabrics for the blank on the two opposed needle beds, and

(b) knitting a set of body fabrics for the blank on the two opposed needle beds, the body fabrics comprising two front body panels and a rear body panel, the method also including,

(c) the step, in knitting one of said sets of fabrics, of taking needles out of action progressively on both needle beds in an inwards direction from both ends of the bank of operative needles of the knitting machine, and holding loops on the needles taken out of action, and

(d) the step, in knitting the other of said sets of fabrics, of bringing the needles made inactive progressively back into knitting action in outwards directions towards the ends of the bank of operative needles of the machine thereby causing wales of the sleeve fabrics to be inclined to wales of the body fabrics in the blank, and further including

(e) the step, in knitting the body fabrics, of knitting one of

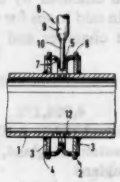
said front body panels before the other, casting one body panel at least partly off the needles before knitting the other body panel and knitting said other body panel partly on needles already used to knit said one body panel to form a garment blank with overlapping front panels.

4,094,172

DEVICE FOR ADDING AND/OR REMOVING FLUID MEDIA IN A ROTATING DRUM

Hans F. Arendt, Bleichinsel, 712 Bietigheim, Wuertt., Germany

Filed Jun. 30, 1976, Ser. No. 701,370
Claims priority, application Germany, Aug. 30, 1975, 2538694
Int. Cl.[2] D06F *39/08*
U.S. Cl. 68—58 **7 Claims**



1. A device for adding and/or removing fluid media in a rotatable drum, comprising:

(a) a rotatable drum of hollow cylindrical configuration defined by a wall;

(b) a pair of annular flange members attached to the outer periphery of the drum and spaced apart to define an annular space extending around the drum;

(c) an elastically yielding sealing member attached to each of said flange members in annular relationship with said drum, each sealing member extending inwardly into said annular space and terminating in a sealing lip, with the respective sealing lips abutting against one another to form a seal in a generally radially extending plane;

(d) at least one fluid media passageway extending through the wall of the drum in the region between the flange members; and

(e) means positioned in said sealing plane for spreading said sealing lips apart, said lip-spreading means comprising a conduit having a generally flattened mouthpiece with a cross-sectional shape having its leading and trailing edges converging to a taper, said lip-spreading means extending into said annular space from the exterior to effect communication with the annular space, said fluid media passageway effecting communication between the annular space and the interior of the cylindrical drum.

4,094,173

VEHICLE LOCK

Jack H. Brown, 10457 Mazatlan Way, Poway, Calif. 92064

Filed Mar. 9, 1977, Ser. No. 775,712
Int. Cl.[2] E05B *65/12*
U.S. Cl. 70—237 **1 Claim**

1. An anti-theft device for releasably locking an engine block of a motor vehicle to an abutting transmission, the transmission having a housing with a plurality of bolt holes disposed in the peripheral portion thereof and the engine block having a plurality of registered bolt holes in marginal flanges integral with the engine block, comprising:

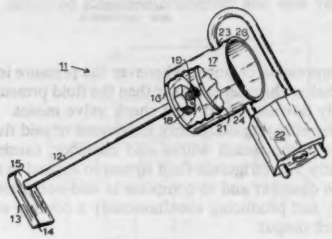
a bolt having a head portion on one end and a threaded portion on its other end, said bolt receivable in one of said engine block and transmission housing registered bolt holes and having a length so as to project therefrom, said head portion having a flat end and an arcuate end opposite said flat end;

a cup member having a closed end, a cylindrical wall extending upwardly from said closed end and an open end at the top of said cylindrical wall, said closed end having an aperture for receiving said threaded portion of said bolt;

a nut threadably received on said threaded end portion of said bolt and being disposed within said cup member and spaced from its open end, said nut being capable of being tightened on said threaded portion to draw the bottom closed end of said cup into engagement with the flanges of the engine block;

spaced inwardly from the open end of said cup are a pair of apertures with one aperture being on the opposite side of the cylindrical wall from the other aperture;

a padlock having one of its shackles passing through said opposing aperture in said cylindrical wall thereby preventing a tool such as the socket of a socket wrench set from being inserted on to said nut;



said cup cylindrical wall being free from any additional aperture that would give access to said nut by a tool utilized to tighten or loosen said nut; and

a floating disc disposed within said cup member between the threaded end of said bolt and the shackle of the padlock that passes through the apertures in the cylindrical wall, said floating disc having a diameter slightly smaller than the interior diameter of said cup member, said floating disc being restricted in rotation due to abutment with the threaded end of said bolt and the shackle when attempts are made to pivot it thereby preventing insertion of a special probe into said cup in order to gain access to said threaded nut.

4,094,174

DRIVE MECHANISM FOR VERTICAL ROLLING MILLS

Hiroji Okuda, Nara, and Hiroyoshi Narikiyo, Yaoshi, both of Japan, assignors to Koyo Seiko Company Limited, Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,958
Claims priority, application Japan, Apr. 5, 1977, 52/39306
Int. Cl.[2] B21B *31/08*
U.S. Cl. 72—238 **4 Claims**

1. A drive mechanism for vertical rolling mills, comprising:

a drive shaft section comprising an inner shaft and an outer sleeve shaft which are axially slidably fitted together,

a universal joint which connects one end of said drive shaft section to the drive side, said universal joint having its fitting yoke fixedly fitted on a drive shaft element,

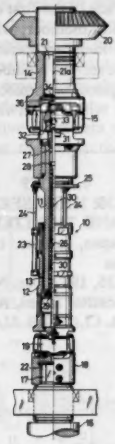
a universal joint which connects the other end of said drive shaft section to the neck of a working roll, said joint having its coupling adapted to be mounted on and dismounted from said roll neck in such a manner as to permit the transmission of torque,

an extensible operating mechanism attached between said inner shaft and said outer sleeve shaft, said mechanism being adapted to mount said coupling on and dismount it from the roll neck by extending and collapsing the drive shaft section,

a spring contained in the drive shaft section, said spring acting in a direction in which it reduces the length of the drive shaft section, and

fixing means provided between said drive shaft section and

said drive universal joint for fixing said drive shaft section and said universal joint together when the drive shaft



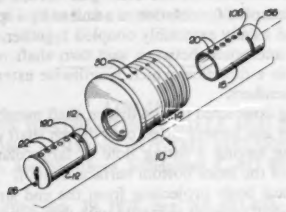
section is reduced in length and for canceling said fixing by the extension of the drive shaft section.

4,094,175

INTERNAL TUMBLER LOCK KEY CHANGE SYSTEM

Julius Pechner, 16010 Blackhawk St., Granada Hills, Calif. 91344

Filed Dec. 20, 1976, Ser. No. 752,084
Int. Cl.[2] E05B *25/00*
U.S. Cl. 70—364 A **23 Claims**



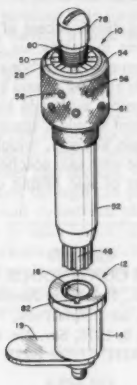
1. A pin tumbler cylinder lock comprising:
an external housing,
a cylindrical opening therein,
a plug rotatable within said cylindrical opening,
said housing and plug having a row of axially aligned locking bores therein,
a key slot in said plug in alignment with said bores,
each of said locking bores having space for springs, wafers, and locking tumbler pins adapted to be positioned and sized to permit the plug to be operated with an operating predetermined key to lock and unlock the lock when the operating key is inserted into the slot, said springs being adapted to bias said pins toward the key slot,
said housing having a row of axially aligned auxiliary bores angularly offset from and transversely aligned with respective locking bores,
each of said auxiliary bores adapted to have springs and master wafers therein, said springs being adapted to bias said master wafers inwardly toward the plug,
a relatively thin-walled shutter sleeve fitted for rotation in said cylindrical opening in said housing,
said plug being fitted within said shutter sleeve for rotation therein and therewith,
a row of axially aligned locking bores in said shutter sleeve in respective radial and axial alignment with the locking bores in said housing and said plug,
first means within the housing and the shutter to prevent rotation of the shutter during operation of the lock when said operating key rotates the plug to lock and unlock the lock, and
second means within the housing, the shutter, and the plug actuated by a lock-combination-changing predetermined key to permit said lock-combination-changing predetermined key to rotate the plug and the shutter in the housing from the operating position of the lock to a combination-changing position of the lock by respectively aligning said locking bores in the plug and shutter with said auxiliary bores in the housing.

4,094,176

PICK FOR TUBULAR CYLINDER LOCKS

Donald R. Hughes, 2600 Brower Ave., Simi Valley, Calif. 93065

Filed Sep. 12, 1977, Ser. No. 832,279
Int. Cl.[2] E05B *19/20*
U.S. Cl. 70—394 **11 Claims**



1. A pick for tubular cylinder locks comprising:
a substantially cylindrical first member having a front end and a back end interconnected by a side wall, said front end having a hollow interior chamber;
a plurality of elongated spaced apart pins slideably mounted within grooves located within said side wall of said first member;
confining means maintaining said pins in connection with said first member;
head locatable within said hollow interior chamber of said first member, said head having an internal recess for connection with the rotatable cylinder portion of a lock, said pins connecting with said head being movable in respect thereto, whereby said head is connected to a cylinder portion with each said pin in contact with a lock tumbler and upon slight axial in and out movement of said head the said pins act against said tumbler and said pins are moved axially.

4,094,177

TAMPER-RESISTANT LOCK AND KEY ASSEMBLY

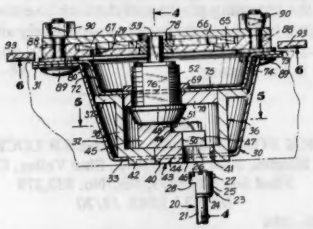
John F. Wellekens, 41 Crescent Ave., New York, N.Y. 10301

Filed Aug. 16, 1977, Ser. No. 825,022
Int. Cl.[2] E05B *17/14*
U.S. Cl. 70—423 **11 Claims**

1. An improved, tamper-resistant lock and key assembly of the type including a generally hollow cylinder, a circular, pin-type tumbler mechanism housed within said cylinder and defining therewith an annular keyway, into which a key may be inserted a fixed distance to permit rotation thereof between

a release and locking position, and a key including a post and a generally cup-shaped bit having a generally circular base secured to one end of said post and extending generally radially outwardly therefrom and a generally cylindrical sidewall secured to said base and extending generally axially outwardly from said end of said post, said sidewall having a bitting formed on the outer end thereof, the improvement comprising:

said key bit having a notched portion formed therein inwardly of said bitting thereof; and



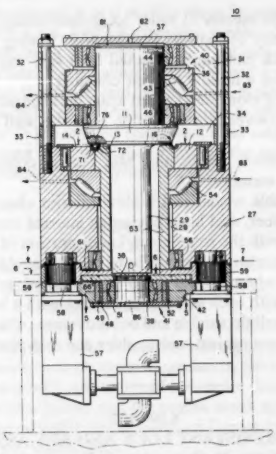
means for obstructing direct access of said key bit to said keyway, said means including an obstruction member spaced above and generally overlying said keyway, which necessitates laterally shifting of said key bit therebelow to effect alignment thereof with said keyway, said member including an abutment shoulder spaced above and overlying a portion of said keyway, which is configured and dimensioned to mate with said notched portion of said key to permit alignment of said bitting of said bit with said keyway.

4,094,178

METHODS FOR CONTINUOUS EXTRUSION

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,611
Int. Cl.[2] B21C *31/00*; B21B *45/02*
U.S. Cl. 72—41 **32 Claims**



1. A method of continuously deforming an elongated workpiece of indefinite length to produce an elongated product of indefinite length, said method comprising the steps of:

(a) providing, in a location adjacent to a deforming agency, a rotary first member and a moveable second member, the first and second members being so disposed that a radially extending first surface on the first member, said radially extending first surface being oriented to intersect an axis of the first member, faces a second surface on the second member; and

(b) gripping the elongated workpiece between said radially extending first surface of the first member and said second surface of the second member; while

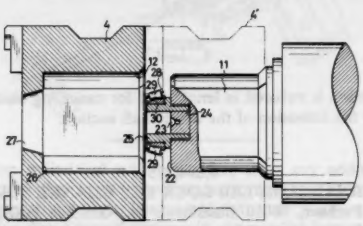
(c) rotating the first member about said axis and simultaneously moving the second member in such direction as to advance the elongated workpiece toward and into the deforming agency, whereby an elongated product is produced.

4,094,179

DRIVING DEVICE FOR HIGH SPEED ROLLING MILLS AND THE LIKE

Hiroji Okuda, Nara, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 818,959
Claims priority, application Japan, Apr. 19, 1977, 52/50028
Int. Cl.[2] B21B *31/08*
U.S. Cl. 72—238 **4 Claims**



1. A driving device for high speed rolling mills and the like, comprising:

two shaft members on the drive and driven sides, respectively, adapted for rotation as a unit as by a spline connection and axially extensibly coupled together,

a spring interposed between said two shaft members and acting in a direction which lengthwise extends said two shaft members,

a coupling connected to said driven shaft member by a joint member and loosely fitted on a driven shaft element, said coupling having a fitting hole of large diameter at the center of the inner bottom surface thereof,

a cylindrical body projecting from the end surface of said driven shaft element coaxially with the center hole thereof and adapted to enter said fitting hole when the coupling and the driven shaft element are fitted together, said cylindrical body cooperating with said fitting hole to define an annular space therebetween, and

a number of taper rollers interposed between said fitting hole and said cylindrical body, said taper rollers being supported for arrangement in said annular space by suitable retaining means and serving to bring the axes of the coupling and the driven shaft element into alignment with each other when the coupling and the driven shaft element are fitted together.

4,094,180

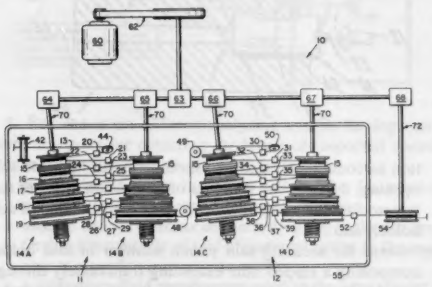
MULTIPLE STAGE WIRE DRAWING MACHINE

Evan Griffiths, Newington, Conn., assignor to Amtel, Inc., Providence, R.I.

Filed May 18, 1977, Ser. No. 798,266
Int. Cl.[2] B21C *1/10, 1/12*
U.S. Cl. 72—280 **13 Claims**

1. In a multiple stage wire drawing machine having at least one pair of rotatable multiple step capstan assemblies, each having an input drive shaft and a plurality of draw capstans of increasing diameter, in aligned generally parallel relationship for drawing a wire back and forth through successive wire

drawing stages respectively, a final stage draw capstan for a final wire drawing stage, a plurality of drawing dies of decreasing die diameter for said successive and final drawing stages respectively for drawing a wire to successively smaller sizes respectively, a machine drive motor, and transmission means connecting the drive motor to the input drive shaft of each multiple step capstan assembly and to the final stage draw capstan for driving the input drive shafts and the final stage draw capstan at fixed relative angular rates of rotation in accordance with the relative diameters of the respective draw capstans and the dies at the respective drawing stages, the



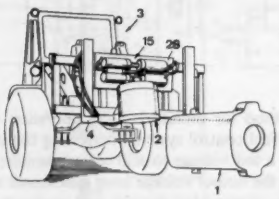
improvement wherein the plurality of draw capstans of increasing diameter of each multiple step capstan assembly are independently rotatably mounted on the respective input drive shaft in axially spaced coaxial relationship, and wherein each multiple step capstan assembly comprises adjustable slip coupling means providing a slip drive between the respective input drive shaft and each draw capstan rotatable thereon for driving the capstan with an established slip drive torque, the adjustable slip coupling means being adjustable for establishing the slip drive torques between the input drive shaft and the draw capstans respectively.

4,094,181

METHOD IN DESTRUCTING CHILLS AND A DEVICE FOR CARRYING OUT THE METHOD

Torsten Boris Joel Westberg, Slojdgatan 4,, 811 00 Sandviken, Sweden

Filed Sep. 29, 1975, Ser. No. 617,838
Claims priority, application Sweden, Oct. 9, 1974, 7412664
Int. Cl.² B21D *31/04*
U.S. Cl. 72—325 **8 Claims**



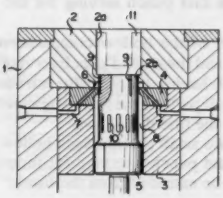
1. A method for destructing chills, characterized in that a tool comprising at least two reciprocally movable parts is introduced into the cavity of the chill, and that said parts are set in motion relative to each other substantially across the length of the chill, preferably by one part being pushed out from the other part so as to squeeze apart the walls of the chills or portions thereof, said tool, during operation, being supported on a vehicle.

4,094,182

DIE APPARATUS FOR PRESS MACHINE

Shohei Kusada, and Tomoyoshi Kaneko, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 24, 1977, Ser. No. 761,626
Claims priority, application Japan, Jan. 23, 1976, 51.005595
Int. Cl.² B21D *45/00*
U.S. Cl. 72—344 **3 Claims**



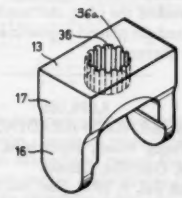
1. A die apparatus for press machine comprising
a die set having a piercing hole formed therein,
a cylindrical plate having a hole formed therein disposed within said die set,
a die disposed on said cylindrical plate within said die set, said die having a die hole formed therein, and
a knockout slidably disposed within said cylindrical plate, said knockout having a plurality of first grooves formed in the upper part thereof and a plurality of second grooves formed in the lower part thereof, whereby compressed air may be introduced through the piercing hole in said die set, the hole in said cylindrical plate and the plurality of second grooves in said knockout into the die hole for blowing off lubricant and particles deposited in the die hole when said knockout is raised and wherein particles of residual oil may be leaked out through the plurality of first grooves to the outside of said die when said knockout is lowered.

4,094,183

METHOD OF FABRICATING A SUBSTANTIALLY U-SHAPED BODY AND APPARATUS FOR THE PERFORMANCE THEREOF

Karl Mettler, Buchs, Switzerland, assignor to Press- & Stanzwerk AG, Eschen, Liechtenstein

Filed Dec. 6, 1976, Ser. No. 747,795
Claims priority, application Switzerland, Dec. 19, 1975, 16489/75
Int. Cl.² B21D *22/00*
U.S. Cl. 72—356 **6 Claims**



1. A punch and die arrangement for extruding two legs for a substantially bifurcated part of a Cardan joint from a substantially parallelpiped-shaped blank having four side surfaces and two end surfaces comprising:
a first die and a first punch cooperating with one another for the partial extrusion of the legs from the blank to form pre-formed extruded legs;
a second die and a second punch cooperating with one

another for bringing the pre-formed legs into their final shape;

the first die and the first punch confining part of the four side surfaces and one end surface of the blank in order to prevent deformation of such surfaces;

each cooperating die and punch limiting a hollow compartment composed of a large substantially parallelpiped-shaped part and two small substantially parallelpiped-shaped parts;

the large part of the hollow compartment formed by the first die and the first punch serving for the reception of the blank;

the large part of the hollow compartment formed by the second die and the second punch serving for the reception of the blank having the partially extruded legs formed in the two small parts of the hollow compartment of the first punch and the first die;

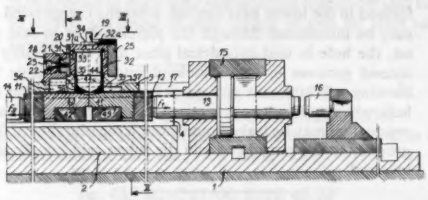
both of the two small parts of each hollow compartment of both dies and punches serving for forming and confining the legs to be extruded from the blank.

4,094,184

MACHINE FOR FORMING JOINING PIPES

Alain Edouard Plegat, Asnieres, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Filed Sep. 30, 1975, Ser. No. 618,052
Claims priority, application France, Oct. 16, 1974, 74 34835
Int. Cl.[2] B21D *41/02*
U.S. Cl. 72—392 **9 Claims**



1. A machine for forming one end of a pipe to be particularly used for heat exchangers so as to exhibit a substantially oblong opening, said oblong opening having a major axis forming any angle with respect to the longitudinal axis of said pipe, the machine comprising a fixedly mounted holder maintaining the pipe on whole periphery thereof in a position in which the end of the pipe which is to be formed is free and extends in a horizontal plane; two complementary or mating shaping pins adapted to be inserted into said free end of the pipe only; and pin supporting and driving means from which said pins protrude for moving said two pins on a trajectory in opposite directions for a distance corresponding to the deformation to be given to said end of the pipe; the machine further comprising at least one fixed die placed opposite at least one of the pins on the trajectory thereof.

4,094,185

DOUBLE-ENDED HEADING PUNCH

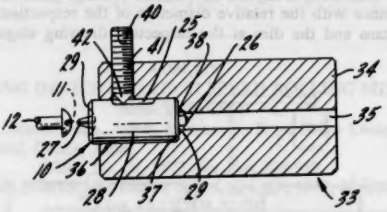
William Hsien-Kuang Wang, Burlington, Canada, assignor to Procor Limited, Oakville, Canada

Filed Jul. 5, 1977, Ser. No. 812,928
Int. Cl.[2] B21D *31/00*
U.S. Cl. 72—477 **7 Claims**

1. A double-ended heading punch that produces a driving-tool engaging recess in an end of a metal blank by a single blow delivered at room temperature, comprising:

(a) a hardened steel punch member having an enlarged generally cylindrical, central body portion terminating in opposed, flat annular shoulders; a recess-forming projection at each end of said punch member extending beyond its associated shoulder along the longitudinal centroidal axis of said punch member; a groove in the surface of said body portion between said shoulders;

(b) a holder for said punch member having an opening passing longitudinally through its center; said opening including an enlarged chamber at one end defining a ledge on the interior of said holder surrounding said opening; said chamber receiving said punch member with one shoulder of said punch member abutting said ledge and the projection surrounded by said one shoulder extending into said opening; the opposite shoulder of said punch member and its associated projection extending beyond the end of said holder; and



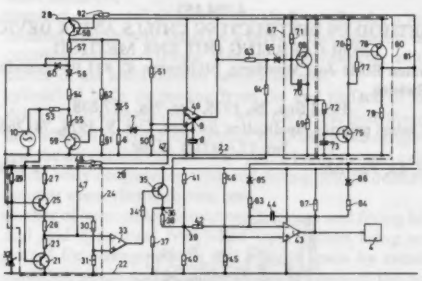
(c) means for securing said punch member in said holder comprising a tapped hole extending transversely through said holder into said chamber; and a threaded member screwed into said hole and extending into said slot and bearing against said punch member.

4,094,186

MIXTURE CONTROL MONITOR APPARATUS

Wolf Wessel, Oberriexingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 25, 1977, Ser. No. 772,151
Claims priority, application Germany, Feb. 28, 1976, 2608245
Int. Cl.[2] G01N *31/00*; F02M *7/00*
U.S. Cl. 73—1 G **10 Claims**



1. A method for monitoring the operation of an oxygen sensor in a fuel control system comprising the steps of:

applying a test voltage to said oxygen sensor;

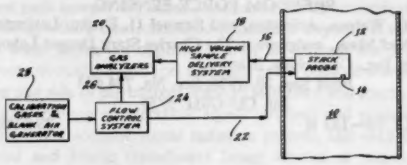
applying the output voltage from said sensor to at least two voltage comparator circuits and comparing it with set point values associated, respectively, with the upper and lower nominal values of said sensor in normal operation thereof;

applying the output signal from said comparator circuits to a timing circuit for enabling a switch which changes the operation of the fuel injection system from closed loop control based on oxygen sensor signals to open loop forward control based on signals from transducers of engine variables.

4,094,187
STACK GAS ANALYZING SYSTEM WITH CALIBRATING/SAMPLING FEATURE

Anatole Joseph Navarre, Jr., Houston, Tex., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 22, 1977, Ser. No. 818,161
Int. Cl.[2] G01N *1/22*
U.S. Cl. 73—1 G 23 Claims



1. For use in an effluent analyzing system having one or more analyzers for detecting the levels of suspected constituents, a calibration/sampling system including:

a. a chambered probe including a first inlet for receiving effluent samples, a second inlet and an outlet;

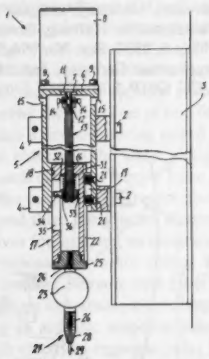
b. sample delivery means connected to the outlet for transferring the contents of said chambered probe to the analyzers at a predetermined rate of flow;

c. a calibrating fluid supply connected to the second inlet for selectively supplying known concentrations of fluids at a rate of flow greater than the rate established by said sample delivery means to force effluent from the chambered probe thereby permitting the analyzers to selectively receive calibrating fluid samples through the probe to the exclusion of effluent fluid samples.

4,094,188
APPARATUS FOR MONITORING THE APPLICATION OF A FORCE TO A SOLID BODY

François C. Bellouin, Mennecy, and Jean G. Dremierre, Ballancourt sur Essonne, both of France, assignors to Societe Nationale des Poudres et Explosifs, France

Filed Dec. 10, 1976, Ser. No. 749,253
Claims priority, application France, Dec. 16, 1975, 75 38474
Int. Cl.[2] G01N *3/42*
U.S. Cl. 73—81 16 Claims



16. A method of measuring the adhesivity or roughness of a material which comprises:

a. applying a measuring contact piece to the material under a predetermined force and during a predetermined period,

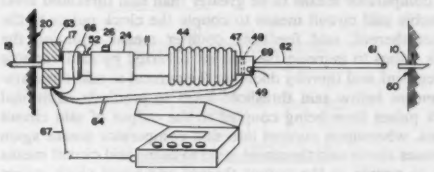
b. applying a tensile force to the measuring contact piece to cause it to be displaced at a constant velocity in the direction opposite to that in which the said force is applied,

c. measuring the maximum tensile force at the moment when the measuring contact piece is separated from the specimen.

4,094,189
MICRO-CREEPMETER

Shosei Serata, 1229 8th St., Berkeley, Calif. 94710

Filed Mar. 24, 1977, Ser. No. 780,800
Int. Cl.[2] G01B *7/16*
U.S. Cl. 73—88 E 9 Claims

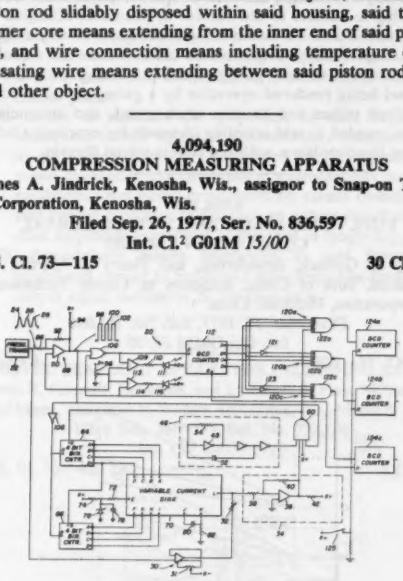


1. A device for quickly determining micro-creep velocity by accurately measuring relative displacement between two objects, comprising a housing; a linear variable displacement transformer disposed within said housing; anchoring means for securing said housing to one of said objects, said transformer having translatable core means disposed within the sensing field of said transformer; and means for joining said transformer core means to the other of said objects, including a piston rod slidably disposed within said housing, said transformer core means extending from the inner end of said piston rod, and wire connection means including temperature compensating wire means extending between said piston rod and said other object.

4,094,190
COMPRESSION MEASURING APPARATUS

James A. Jindrick, Kenosha, Wis., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Sep. 26, 1977, Ser. No. 836,597
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—115 30 Claims



11. Apparatus for measuring peak compression in each of a plurality of compression chambers of an internal combustion engine, said apparatus comprising means for producing a sequence of compression pulses respectively corresponding to the compressions in the chambers, comparator means coupled to said transducer means and being responsive to current caused by the compression pulses exceeding a threshold level to produce an enable signal, circuit means including a clock for producing a sequence of clock pulses at a frequency many times the frequency of the compression pulses, said circuit means having an output and a control input coupled to said comparator means, said circuit means being responsive to said enable signal to couple clock pulses to said output and being responsive to the absence of said enable signal to isolate the clock pulses from said output, feedback counter means coupled

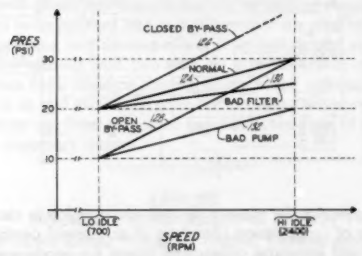
to the output of said circuit means for counting clock pulses coupled therethrough, said feedback counter means having a reset input coupled to receive the compression pulses and being reset after the peak of each compression pulse, a variable current sink coupled to said feedback counter means and being operative to drain a quantity of current that increases with the number of clock pulses applied thereto, said variable current sink being coupled to said transducer means and in parallel with said comparator means and being operative to divert current therefrom in accordance with the value of said sink, the commencement of a compression pulse causing current to said comparator means to be greater than said threshold level to enable said circuit means to couple the clock pulses to the output thereof, said feedback counter means counting the clock pulses to increase the current diverted by said variable current sink and thereby decrease the current to said comparator means below said threshold level to preclude additional clock pulses from being coupled to the output of said circuit means, whereupon current into said comparator means again increases above said threshold level to cause said circuit means then to couple to the output thereof additional clock pulses which are further counted by said feedback counter means to increase the current diverted by said variable current sink, said circuit means thereby being periodically enabled to couple to the output thereof clock pulses until the amplitude of the compression pulse reaches a peak and begins to decrease, means for producing a sequence of a plurality of gating signals corresponding in number to the number of compression chambers and respectively corresponding to the compression pulses, a plurality of counting channels coupled in parallel and corresponding in number to the number of chambers of which the compression is to be measured, each channel having a signal input coupled to the output of said circuit means and a control input coupled to said gating signal producing means, each channel being rendered operative by a gating signal to count the clock pulses and to store such count, and annunciator means coupled to said counting channels for expressing information in accordance with the counts stored therein.

4,094,191

FUEL PUMP DIAGNOSTICS FOR INTERNAL COMBUSTION ENGINE

Henry E. Goetsch, Broadbrook, and Henry J. Mercik, Jr., Enfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 25, 1977, Ser. No. 781,095
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—118 **8 Claims**



1. In a method of diagnosing an engine fuel system of the type having a fuel pressure-regulating bypass valve, which is normally closed to provide fuel at full pump pressure at low speeds, and opens proportionally to bypass fuel to limit the pressure thereof at higher speeds, the steps of:

operating the engine at substantially a low idle speed and at substantially a high idle speed;

at each of said speeds, measuring the pressure of fuel provided to the bypass valve by a pump; and

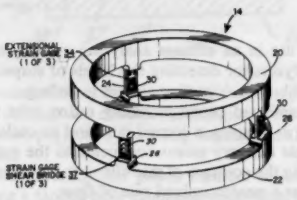
providing a manifestation of the fact that the bypass valve is stuck in the open position if the pressure measured at said high idle speed is substantially the normal rated high idle speed fuel pressure for the engine under test and the pressure measured at said low idle speed is lower than the normal rated low idle speed fuel pressure for the engine under test.

4,094,192

METHOD AND APPARATUS FOR SIX DEGREE OF FREEDOM FORCE SENSING

Paul C. Watson, Arlington, and Samuel H. Drake, Lexington, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Sep. 20, 1976, Ser. No. 724,623
Int. Cl.[2] G01L *5/16*
U.S. Cl. 73—133 R **28 Claims**



1. A six-degree of freedom force sensor, comprising:

a first section;

a second section;

three physically distinct and separate intermediate sections spaced apart from one another, each of the intermediate sections being disposed between and connecting the first and second sections;

means for measuring shear strain in each of the intermediate sections and producing an output signal representative thereof; and

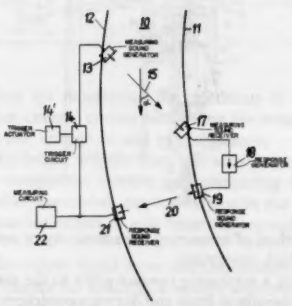
means for measuring extensional strain in each of the intermediate sections and producing an output signal representative thereof.

4,094,193

ACOUSTIC SYSTEM FOR MEASURING THE SPEED OF CURRENTS IN A BODY OF WATER

Manfred Gerlach, Bremen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed May 6, 1977, Ser. No. 794,660
Claims priority, application Germany, Jun. 24, 1976, 2628336
Int. Cl.[2] G01P *5/00*; G01F *1/66*
U.S. Cl. 73—170 A **9 Claims**



1. In a system for measuring the speed of flow of a current in a body of water, which system includes a first electroacoustic

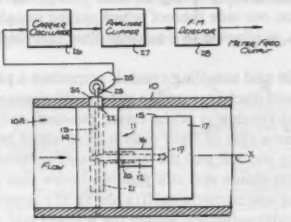
transducer disposed in the body of water along one side of the current and a second electroacoustic transducer disposed in the body of water along the opposite side of the current, each transducer having an electrical signal terminal and presenting a directional acoustic signal radiation pattern, the transducers being located at respectively opposite ends of a first path extending through the water, across the current and oblique to the direction of current flow and each transducer being oriented so that the axis of its radiation pattern extends along the first path toward the other transducer, the improvement comprising: a third electroacoustic transducer disposed in the body of water along the opposite side of the current and a fourth electroacoustic transducer disposed in the body of water along the one side of the current, each of said third and fourth transducers having an electrical signal terminal and presenting a directional acoustic signal radiation pattern, and each of said third and fourth transducers being located at respectively opposite ends of a second path extending through the water and across the current and being oriented so that the axis of its radiation pattern extends along the second path toward the other one of said third and fourth transducers; response generator means located at the opposite side of the current and having an input and an output and arranged to produce an electrical response pulse at its output upon appearance of an electrical signal pulse at its input; first connecting means connecting the input of said response generator means to the electrical signal terminal of one of said second and third transducers and connecting the output of said response generator means to the electrical signal terminal of the other one of said second and third transducers for causing receipt of an acoustic pulse by said one of said second and third transducers to result in the emission of an acoustic pulse into the water by said other one of said second and third transducers; trigger circuit means located at one side of the current and having an input and an output and arranged to produce an electrical trigger pulse at its output upon appearance of an electrical signal pulse at its input; second connecting means connecting the input of said trigger circuit means to the electrical signal terminal of one of said first and fourth transducers and connecting the output of said trigger circuit means to the electrical signal terminal of the other one of said first and fourth transducers for causing receipt of an acoustic pulse by said one of said first and fourth transducers to result in the emission of an acoustic pulse into the water by said other one of said first and fourth transducers, said other one of said first and fourth transducers and said one of said second and third transducers being located at respectively opposite ends of one of said paths, while said one of said first and fourth transducers and said other one of said second and third transducers being located at respectively opposite ends of the other one of said paths, whereby the other one of said first and fourth transducers constitutes a first measuring sound generator for emitting an acoustic pulse into the water along its respective path in response to each electrical trigger pulse applied to its signal terminal from the outpt of said trigger circuit means, said one of said second and third transducers constitutes a first measuring sound receiver for applying an electrical signal pulse to the input of said response generator means in response to each acoustic pulse incident thereon, said other one of said second and third tranducers constitutes a first response sound generator for emitting an acoustic response pulse into the water in response to each electrical response pulse applied to its signal terminal from the output of said response generator means, and said one of said first and fourth transducers constitutes a first response sound receiver for applying an electrical signal pulse to the input of said trigger circuit means in response to each acoustic pulse incident thereon; and means connected in said system for evaluating the repetition rate at which acoustic pulses are produced by said first measuring sound generator to provide an indication of the current flow speed.

4,094,194

SENSING SYSTEM FOR VORTEX-TYPE FLOWMETERS

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Feb. 14, 1977, Ser. No. 768,414
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—194 VS **4 Claims**



1. A noise-rejecting sensing system for a vortex-type flowmeter adapted to measure the flow rate of a fluid passing therethrough by generating fluidic pulses whose frequency which varies within a low-frequency range is a function of flow rate, said system comprising:

A. a sensor constituted by a variable reactance element included in the frequency-determining circuit of a carrier oscillator generating a relatively high-frequency carrier signal;

B. means to apply said fluidic pulses to said sensor to vary the reactance thereto to thereby frequency- and amplitude-modulate said carrier signal in accordance with said fluidic pulses;

C. means to maintain the amplitude of said frequency-modulated carrier signal at a substantially constant level to produce a frequency-modulated carrier signal, said means to maintain the amplitude at a substantially constant amplitude level being constituted by means overdriving said carrier oscillator to produce an output signal of constant amplitude regardless of the shift in frequency; and

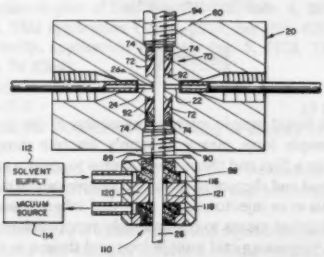
D. demodulator means responsive to said frequency-modulated carrier to produce a noise-free, low-frequency output signal indicative of the flow rate.

4,094,195

NOVEL SEAL AND APPARATUS INCLUDING SAME

David R. Friswell, Holliston, and Lawrence J. Finn, Millis, both of Mass., assignors to Waters Associates, Inc., Milford, Mass.

Filed Feb. 25, 1977, Ser. No. 772,144
Int. Cl.[2] G01N *1/10*
U.S. Cl. 73—422 GC **6 Claims**



1. In a liquid sample injection apparatus of the type comprising a sample loop, means to supply discrete samples to said loop from a first end thereof and means to supply solvent from the second end thereof to push said sample out of said injection apparatus at an injector outlet port, and wherein said apparatus

also comprises means to supply solvent through a conduit bypassing said sample loop and thence to said injector outlet port at the same side at which said sample loop is emptied into said outlet port, the improvement wherein

(a) said means to supply discrete samples to said loop comprises a sampling conduit that forms part of said sample loop and is moveable in a vertical channel between a sample-intake position and a sample-discharge position,

(b) wherein said sampling conduit comprises a discharge orifice on one side thereof which, in the sample-discharge position, is adapted to discharge fluid into said outlet port and

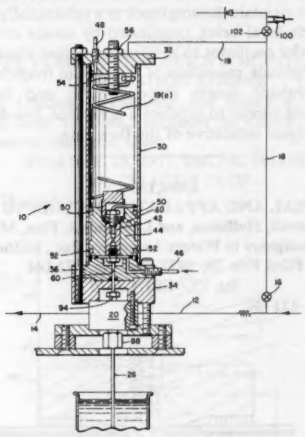
(c) wherein said sampling conduit comprises a plug member below said discharge orifice to seal said channel when said sampling conduit is in the raised position, and

(d) wherein a pair of fluid seals is maintained between said sampling conduit and the walls of said vertical channel at a position above and at a position below said outlet port, each said seal comprising: (i) a sleeve of compressible resin about said conduit and within the walls of said channel, (ii) stress rings mounted adjacent above and below each of said sleeves, said stress rings each having a protrusion facing the adjacent sleeve to indent the axial upper and lower extremities of each of said sleeves toward each other when each sleeve is compressed between the rings to form a sealing contact between said sample-intake conduit and said walls, and (iii) means to compress each sleeve between a pair of said stress rings.

4,094,196
SAMPLE INJECTION WITH AUTOMATIC CLEANING OF SAMPLING CONDUIT

David R. Friswell, Holliston, Mass., assignor to Waters Associates, Inc., Milford, Mass.

Filed Feb. 25, 1977, Ser. No. 772,145
Int. Cl.² G01N 1/14
U.S. Cl. 73—422 GC **14 Claims**



1. In a liquid sample injection apparatus of the type comprising a sample loop, means to supply discrete samples to said loop from a first end thereof and means to supply solvent from the second end thereof to push said sample out of said injection apparatus at an injector outlet port, and wherein said apparatus also comprises means to continuously supply solvent through a conduit by-passing said sample loop and thence to said injector outlet port at the same site at which said sample loop is emptied into said outlet port, the improvement

wherein said means to supply discrete samples to said loop comprises a sampling conduit that forms part of said sample loop and is moveable in a vertical channel between a sample-intake position and a sample-discharge position,

wherein said sampling conduit comprises a discharge orifice on one side thereof which, in the sample-discharge position, is adapted to discharge fluid into said outlet port

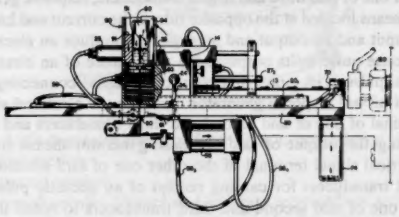
wherein said sampling conduit comprises a plug member below said discharge orifice to seal said channel when said sampling conduit is in the raised position, and

wherein said means to supply solvent through a conduit bypassing said sample loop includes an annular passage proximate said orifice when said orifice is in its sample-discharge position.

4,094,197
SEMI-AUTOMATIC AND AUTOMATIC FLUID INJECTORS

Rano J. Harris, Sr., 1945 Carolyn Sue Dr., Baton Rouge, La. 70815; Rano J. Harris, Jr., 5443 Stonewall Dr., Baton Rouge, La. 70816, and Julius P. Averette, Jr., 4332 Delaware, Baton Rouge, La. 70805

Filed Jul. 21, 1977, Ser. No. 817,817
Int. Cl.² G01N 1/12
U.S. Cl. 73—423 A **23 Claims**



1. A fluid injector, or apparatus, for use in withdrawing a fluid specimen from a fluid specimen containing septum type vial, for accurately measuring, and then injecting in preselected quantity into a medium which, in combination, comprises

(a) a fluid injector sub-assembly, inclusive of

a barrel,

a hollow needle mounted on an end of the barrel providing an opening from the dispensing end of said needle through said needle and barrel, and

means for opening said barrel to permit flow of fluid specimen through said barrel and needle, and closure to interrupt said flow,

(b) an injector feed sub-assembly, inclusive of

a fixed probe assembly comprising

a gas supply conduit with gas inlet and gas outlet means,

a fluid specimen supply conduit with fluid specimen inlet means, and outlet means connected to the barrel and operatively associated with the means of said fluid injector sub-assembly which opens and closes said barrel to the flow of said fluid specimen, and

means for puncturing the septum of the fluid specimen containing vial so that the gas and fluid specimen supply conduits can enter into and lie within the vial,

(c) a magazine sub-assembly, inclusive of

means adapted to carry a fluid specimen containing vial in an inverted position with its septum side faced downwardly, in reciprocatable fashion, such that on downward movement the septum portion of the vial can be impaled upon and pierced by the puncturing means of said fixed probe assembly such that the gas and fluid specimen supply conduits lie within the vial, the fluid contents of the vial can be pressurized by injection of gas into the vial via the gas inlet conduit and fluid specimen transported via the fluid specimen outlet to the barrel, whereby on the ingress of an initial portion of the fluid specimen the barrel and needle can be purged and cleaned, an accurately measured portion of

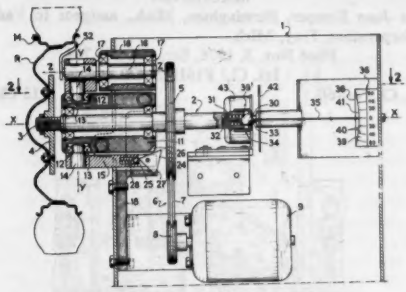
the fluid specimen can then be trapped, and then injected on insertion of the dispensing end of the needle into said medium.

4,094,198

MACHINE FOR BALANCING A BODY OF REVOLUTION

André Moulinoux, Marnes-la-Coquette, France, assignor to Facom, Morangis, France

Filed Jun. 1, 1977, Ser. No. 802,585
Claims priority, application France, Jun. 4, 1976, 76 17003
Int. Cl.[2] G01M *1/16*
U.S. Cl. 73—460 12 Claims



1. In a machine for balancing a body of revolution, such as a vehicle wheel, comprising a housing, a shaft mounted in the housing to rotate about a horizontal axis and also to oscillate about a vertical axis which intersects said horizontal axis and is located near to a first end of the shaft, mounting means for mounting the body of revolution provided adjacent to said first end for rotating said body about said horizontal axis, driving means for driving the shaft in rotation, an elongated indicator member, a ball articulation mounting the idicator member on a second end opposed to said first end of said shaft so that the indicator member is in the extension of said shaft, a measuring scale disposed adjacent to an end of the indicator member opposed to said articulation, and means for deviating the indicator member and adapted, in the course of rotation of the shaft, to come momentarily in contact with the indicator member at a predetermined place in the length thereof so as to achieve a deviation of the indicator member with respect to the scale which is a function of the magnitude of the unbalance of the body of revolution, the ball articulation being provided with means for ensuring the remanence of said deviation; the improvement comprising arranging said deviating means in the form of a cam mounted to rotate about an axis which is parallel to the axis of the shaft and associated with driving means, the cam having a radially outermost portion capable of coming momentarily in contact with the indicator member in the course of a revolution of the cam and the peripheral speed of the cam being approximately equal but of opposite direction to that of the indicator member.

4,094,199

ACCELEROMETER

Frederick V. Holdren, Redmond; Hans W. Hugli, Bellevue; John M. Kubler, Bellevue; Martin E. Larson, Bellevue, and Michael M. Van Schoiack, Bellevue, all of Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 6, 1976, Ser. No. 702,781
Int. Cl.[2] G01P *15/08*
U.S. Cl. 73—517 B 37 Claims

8. A servoed accelerometer comprising:

a housing configured in a generally cylindrical shape;

a one-piece support frame secured within said housing;

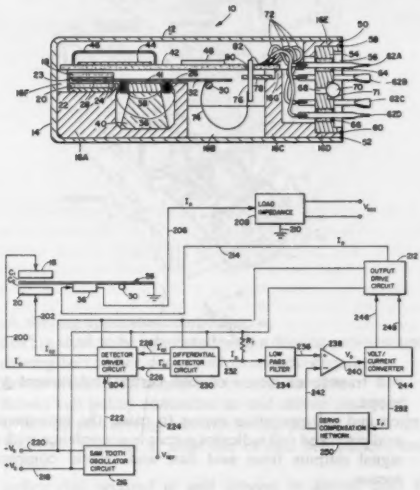
a pendulum including a paddle at one end;

support means secured to said support frame, including an axle, for supporting said pendulum generally parallel to the cylindrical axis of said housing wherein said axle is secured transversely to said pendulum;

a pair of spaced parallel capacitor plates secured within said housing wherein said paddle is located in a space parallel relationship between said plates and movable transversely to the plane of said plates in response to acceleration forces perpendicular to the surface of said paddle;

restoring means, including a magnetic assembly secured to said support frame and a torque coil secured to said pendulum, for moving said paddle to a predetermined position between said plates;

a generally rectangular shaped circuit support member secured to each end within said support frame above and generally parallel to said pendulum; and



an electronic circuit secured to one side of said circuit support member and electrically connected to said capacitor plates, said pendulum and said torque coil effective to generate a restoring current in said torque coil for moving said paddle to said predetermined position when said paddle has moved closer to one or another of said plates in response to an acceleration force.

4,094,200

METHOD AND EQUIPMENT FOR MAKING ROLL AND PITCH DATA INPUTS INTO A PILOTING INSTRUMENT

Pierre Andre Chombard, Boulogne-sur-Seine, France, assignor to Societe Francaise d'Equipements pour la Navigation Aerienne S.F.E.N.A., Velizy-Villacoublay, France

Continuation-in-part of Ser. No. 448,022, Mar. 4, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,218
Claims priority, application France, Mar. 5, 1973, 7307784; Oct. 7, 1974, 74 33661
Int. Cl.[2] G01C *19/02, 19/00;* G08G *5/00*
U.S. Cl. 74—5 R 13 Claims

1. Apparatus for facilitating the piloting of aircraft comprising

a gyroscopic horizon including a vertical instrument gyroscope with a built-in erector means, and pitch and roll indicator means,

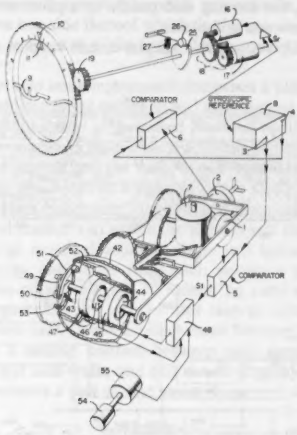
transducer means to transmit electrical signals proportional to pitch and roll changes attached on the pitch and roll suspension axes of said vertical instrument gyroscope,

gyroscopic reference means having stable gyroscopic means and pitch and roll electrical transducer means attached to said gyroscopic means,

first comparator means connected to receive and compare the signals and produce a signal output proportional to the difference in signals from said pitch electrical transducer

means of said gyroscopic reference means and said pitch transducer means of said vertical instrument gyroscope,

second comparator means connected to receive and compare the signals and produce a signal output proportional to the difference in signals from said roll electrical transducer means of said gyroscopic reference means and said



roll transducer means of said vertical instrument gyroscope,

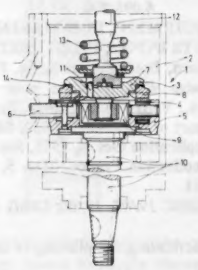
pitch and roll operating means to cause the movement of said pitch and roll indicator means in accordance with said signal outputs from said first and second comparator means.

4,094,201

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Franz Eheim, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed May 12, 1976, Ser. No. 685,652
Claims priority, application Germany, May 21, 1975, 2522373
Int. Cl.[2] F02M *41/2, 59/44;* F16H *25/12*
U.S. Cl. 74—56 **4 Claims**



1. In a fuel injection pump for an internal combustion engine, including: a rotatable drive shaft; a reciprocating and simultaneously rotating pump plunger; and a cam drive mechanism engageable with the pump plunger, said cam drive mechanism including: a two part cam disk; and roller means engageable with the cam disk for imparting to the cam disk, and pump plunger, a displacement in the reciprocating direction of the pump plunger, said two part cam disk, comprising:

a support member manufactured of an elastic material which exhibits a high degree of core toughness, said support member having coupling means for coupling to the drive shaft, thereby producing rotation of the cam drive mechanism and the pump plunger; and

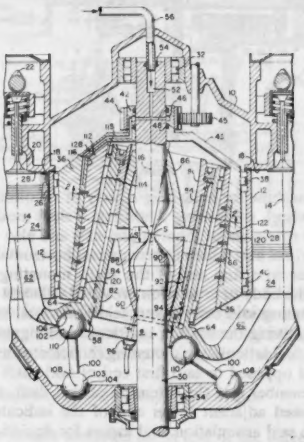
a cam ring bonded to the support member, and manufactured of a casehardened wear-resistant material.

4,094,202

PISTON STROKE VARYING MECHANISM FOR EXPANSIBLE CHAMBER ENERGY CONVERSION MACHINES

Yves Jean Kemper, Birmingham, Mich., assignor to Vadetec Corporation, Troy, Mich.

Filed Nov. 3, 1976, Ser. No. 738,704
Int. Cl.[2] F16H *23/00*
U.S. Cl. 74—60 **13 Claims**



1. An expansible chamber energy conversion machine comprising:

a frame;

a torque transmitting member supported by said frame for rotation about a first axis;

means including a piston to define a working fluid chamber on said frame, said piston being reciprocable on a second axis through a stroke distance to establish relatively large and small chamber volumes, said chamber having an end face fixed relative to said frame and spaced from said piston by a clearance distance when said piston is positioned to establish said small chamber volume;

transmission means drivably interconnecting said piston and said torque transmitting member, said transmission means including a nutatable member having a third axis intersecting said first axis at an angle to establish a point of axes intersection, said third axis being revolvable about said first axis, and extension means having one end connected to said nutating member and another end connected to said piston; and

means for modifying said angle of first and third axes intersection to vary the stroke distance of said piston and to shift the locus of piston reciprocation for controlling said clearance distance in accordance with selected working chamber operating parameters, said last mentioned means comprising swivel means movable with said nutating member in a generally circular path about a fourth axis intersecting said point of axes intersection, the diameter of said path in a plane containing said first and second axes being proportional to the stroke distance of said piston.

4,094,203

INFINITELY VARIABLE DRIVE METHOD AND APPARATUS

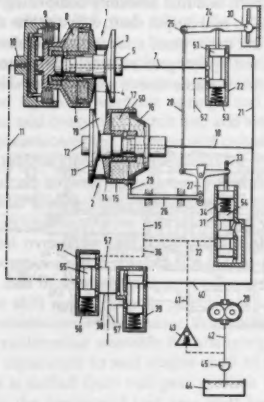
Petrus Henricus van Deursen, Deurne, and Hemmo Hermannes Johannes Ludoph, Heeze, both of Netherlands, assignors to Van Doorne's Transmissie B.V., Netherlands

Filed Feb. 2, 1977, Ser. No. 765,055

Claims priority, application Netherlands, Feb. 9, 1976, 7601287

Int. Cl.[2] F16H *55/52*

U.S. Cl. 74—230.17 F 3 Claims



1. A transmission assembly for transmitting a torque from a drive motor to a driven apparatus, with an infinitely variable transmission ratio, comprising:

an input shaft adapted to receive the output of the drive motor, first and second V-shaped pulleys, a hydraulically operable clutch, the clutch being operatively connected to transmit torque between the input shaft and the first pulley, an output shaft, the output shaft being connected to the second pulley, an endless transmission member or belt wound around the first and second pulleys, each of said pulleys comprising a pair of facing, conical pulley halves, assembled for rotation about a common axis, means associated with each of the first and second pulleys for adjusting the distances between the respective pulley halves thereof, said adjusting means being responsive to hydraulic fluid pressure, a pump for supplying hydraulic fluid under pressure to control said adjusting means, the pump being driven by the input shaft, a hydraulic control line operatively connected between the pump and the clutch for supplying hydraulic fluid to the clutch to effectuate clutch operation, a reducing valve, and a control valve operable in response to the fluid pressure supplied thereto, the reducing valve and control valve being operatively connected to the hydraulic control line to control the pressure of the fluid supplied to the clutch, whereby the clutch is engaged and the transmission driven only when the belt wound around the pulleys is tensioned by means of sufficient fluid pressure and the clutch is disengaged, in the absence of sufficient fluid pressure, disconnecting the drive motor from the transmission.

4,094,204

DRIVING APPARATUS AND METHOD

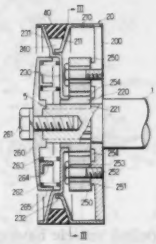
Akinori Yamamoto, Kariya, and Masumi Kato, Toyoake, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 30, 1976, Ser. No. 710,151

Claims priority, application Japan, Aug. 9, 1975, 50-96822

Int. Cl.[2] F16H *55/52, 5/46;* F16D *43/02*

U.S. Cl. 74—230.17 E 4 Claims



1. A driving apparatus comprising:

a driving shaft to be connected with a driving power source;

a driving belt pulley connected to said driving shaft;

a driven shaft to be connected to a driven unit;

a driven belt pulley connected to said driven shaft; and

a V belt on said driving and driven belt pulleys to link them together, wherein at least one of said belt pulleys comprises:

a pulley disk secured to said driving or driven shaft for rotating integrally with said shaft;

a generally cylindrical first pulley plate secured to the periphery of said pulley disk at one end thereof, said first pulley plate having a first slope portion at the other end thereof;

an outer straight spline formed on said driving or driven shaft;

a slidable helical gear having an inner straight spline engaging with said outer straight spline, said helical gear rotating integrally with said shaft but slidable relative to said shaft along said splines;

a generally dish-like second pulley plate fixed to said helical gear for rotating and sliding integrally with said helical gear,

a second slope portion formed on the periphery of said second pulley plate and facing on said first slope portion of said first pulley plate for forming with said first slope portion a V shaped annular groove in which said V belt is disposed, the width of said annular groove being changed by the slide of said second pulley plate;

an end plate fixed to said shaft;

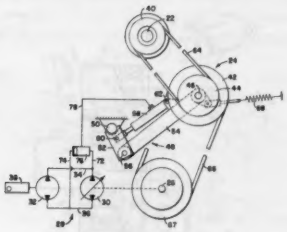
at least one return spring interposed between said end plate and said second pulley plate for biasing said second pulley plate and hence said helical gear; and

at least one weight having a foot portion rotatably supported on said driving disk, said foot portion having at the periphery thereof a helical gear portion engaging with said helical gear, said weight rotating with said shaft and being revolved relative to said disk by the centrifugal force acting thereon thereby to shift said helical gear against the force of said return spring, whereby the width of said annular groove and hence the effective diameter of at least one of said pulleys is changed in response to the rotational speed of said driving power source to change the speed ratio of said driven shaft to said driving shaft.

4,094,205
COMBINED BELT AND HYDROSTATIC VEHICLE DRIVE

Charles Edward Cook, Hampton, Ill., assignor to Deere & Company, Moline, Ill.

Filed Apr. 25, 1977, Ser. No. 790,444
Int. Cl.[2] F16H 7/12
U.S. Cl. 74—242.1 FP **10 Claims**



1. In a self-propelled vehicle having a power source, a belt drive means connected to and driven by the power source, a variable ratio hydrostatic drive including a pump, connected to and driven by the belt drive means, a motor, and a hydraulic conduit means connecting the pump to the motor, and means connecting the motor to the vehicle drive wheels, the improvement comprising: a belt tensioning means associated with the belt drive means and including a belt engaging element shiftable in opposite directions to respectively increase or decrease the belt tension in the belt drive means; a hydraulic actuator operatively connected to the belt engaging element for exerting a force thereon that urges the element in a tension increasing direction; and means operatively connecting the hydraulic actuator to the conduit means of the hydrostatic drive so that the force exerted by the hydraulic actuator and consequently the belt tension is responsive to the pressure in the conduit means.

4,094,206
GEAR TRANSMISSION

Yoshitaka Sogo, and Shuichiro Ida, both of Toyota, Japan, assignors to Tokyo Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 18, 1975, Ser. No. 614,528
Claims priority, application Japan, Apr. 2, 1975, 50-39236
Int. Cl.[2] F16H 3/04, 3/08
U.S. Cl. 74—360 **5 Claims**

1. A gear transmission comprising:

(a) a transmission case having front and rear end walls;

(b) an input shaft and an output shaft rotatably and coaxially disposed within said transmission case, said input shaft extending through said front end wall and said output shaft extending through said rear end wall of said transmission case;

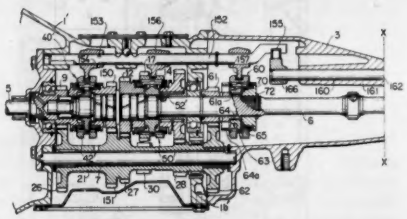
(c) a countershaft rotatably disposed within said transmission case and parallel to said input and output shafts, said countershaft extending through said rear end wall of said transmission case;

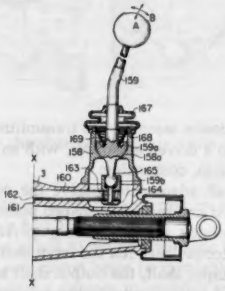
(d) first and second drive gears housed in said transmission case, said first drive gear being mounted on said input shaft and meshed with said second drive gear mounted on said countershaft for transmitting torque from said input shaft to said countershaft;

(e) a plurality of pairs of transmission gears of different gear ratios housed in said transmission case for obtaining different speed ratios of said input shaft to said output shaft, the first gear of each transmission gear pair being rigidly mounted on said countershaft and the corresponding second gear of each pair rotatably mounted on said output shaft, and wherein said pairs include a first speed gear rotatably fitted on said output shaft rearwardly from said first drive gear, a second speed gear rotatably fitted on said output shaft between said first drive and first speed gears, said first and second speed gears being meshed with corresponding first and second speed gears fixedly mounted on said countershaft, and a reverse speed gear rotatably fitted on said output shaft rearwardly of said first speed gear and operatively engaged with the corresponding reverse speed gear fixedly mounted on said countershaft;

(f) a plurality of transmission synchronizer assemblies mounted within said transmission case on said output shaft and selectively engageable with said first drive gear and said transmission gears rotatably mounted on said output shaft for coupling said gears to said output shaft, and wherein said assemblies include

(i) a first assembly mounted between said first drive gear and said second speed gear rotatably fitted on said output shaft, said first assembly comprising a first clutch hub fixed to said output shaft, a first spline element fixed to said first drive gear, a second spline element fixed to said second speed gear rotatably fitted to said output shaft, a first slidable sleeve splined over said first clutch





hub for axial movement and engagement with said first or second spline elements, a first synchronizer ring adjacent to said first spline element, a second synchronizer ring adjacent to said second spline element, springs, and a plurality of shifting keys biased by said springs and interposed between said first clutch hub and said first sleeve; and

(ii) a second assembly mounted on said output shaft between said first speed gear and reverse speed gear rotatably fitted on said output shaft, said second assembly comprising a second clutch hub attached to said output shaft, a third spline element fixed to said first speed gear rotatably fitted to said output shaft, a fourth spline element fixed to said reverse speed gear rotatably fitted to said output shaft, a second slidable sleeve splined over said clutch hub for axial movement and engagement with said third or fourth spline elements, a synchronizer ring adjacent to said third spline element, second springs, and a plurality of shifting keys biased by said second springs and interposed between said second clutch hub and said second sleeve;

(g) an overdrive mechanism mounted outside and adjacent to said rear end wall of said transmission case including
(i) first and second overdrive gears continuously meshed with each other, said first overdrive gear being rigidly mounted on that portion of said countershaft adjacent to and extending through said rear wall, and said second overdrive gear being rotatably mounted on that portion of said output shaft adjacent to and extending through said rear wall and being formed with a boss portion extending in the direction remote from said rear wall, and
(ii) an overdrive synchronizer assembly comprising a spline element rigidly mounted on said output shaft rearwardly of said second overdrive gear and adjacent said boss portion remote from said rear wall, a synchronizing ring, a clutch hub integrally secured to said boss portion, a slidable sleeve spline-coupled to said overdrive clutch hub and selectively actuated for axial movement rearwardly to mesh with said overdrive spline element for coupling said second overdrive gear to said output shaft, springs, a plurality of shifting keys biased by said overdrive springs and interposed between said overdrive clutch hub and sleeve, and a stopper plate interposed between said overdrive clutch hub and said second overdrive gear for maintaining said overdrive shifting keys between said overdrive clutch hub and sleeve, and wherein the gear ratio of said first and second overdrive gears are such that when said second overdrive gear is coupled to said output shift, said output shaft is rotated at a higher rotational speed than said input shaft; and

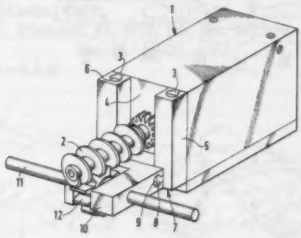
(h) a gear shift mechanism for selectively actuating one of said transmission synchronizer assemblies or said overdrive synchronizer assembly for changing the speed ratio of said input shaft to said output shaft as said gear transmission is shifted from one gear position to another, and wherein the position of said gear shift mechanism in the gear shift pattern for actuating said overdrive synchronizer assembly is opposite to the position of said gear shift mechanism for actuating the one of said transmission synchronizer assemblies obtaining the highest transmission gear ratio, and wherein said gear shift mechanism includes
(i) a gear shift lever having first, second, third, reverse, overdrive and neutral positions;
(ii) a first-and-reverse gear fork shaft and a second-and-third gear fork shaft for axial displacement, said shafts being parallel to each other and lateral to said first and second synchronizer assemblies;
(iii) a first shift fork coupled to said slidable sleeve of said first synchronizer assembly and to said second-and-third gear fork shaft, and a second shift fork coupled to said slidable sleeve of said second synchronizer assembly and to said first-and-reverse gear fork shaft;
(iv) means for retaining said first-and-reverse gear fork shaft in a neutral, first, or reverse gear position, and means for retaining said second-and-third gear fork shaft in a neutral, second or third gear position;
(v) means for preventing simultaneous axial displacement of said fork shafts;
(vi) an overdrive gear fork shaft for axial displacement parallel and adjacent to said first-and-reverse and second-and-third gear fork shafts;
(vii) an overdrive shift fork coupled to said slidable sleeve of said overdrive synchronizer assembly and to said overdrive fork shaft;
(viii) means for limiting the axial displacement of said overdrive fork shaft;
(ix) means for retaining said overdrive fork shaft in a neutral or overdrive gear position; and
(x) internal selection means responsive to the position of said gear shift lever for selectively engaging one of said gear fork shafts for moving one of said slidable sleeves into engagement with one of said first drive, transmission or overdrive gears.

4,094,207

DRIVE ARRANGEMENT PARTICULARLY FOR A TOY MODEL

Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Germany

Filed Feb. 4, 1977, Ser. No. 765,801
Claims priority, application Germany, Feb. 12, 1976, 7603968[U]
Int. Cl.² F16H *1/16*
U.S. Cl. 74—425 **6 Claims**



1. A drive arrangement, particularly for a toy model assembled of component parts, comprising a housing having a wall; motor means housed in said housing and having a drive screw extending through said wall; a gear wheel adapted to mesh with said drive screw and being mounted on an axle; a first connecting portion provided on said wall and being elongated in a first direction, said first connecting portion comprising elongated undercut projections mounted on said wall of said housing; an adapter member engageable with and movable over said undercut projections of said first connecting portion in said first direction so as to be mounted on said wall of said housing, said adapter member having a recess for passage of said drive screw therethrough; a second connecting portion provided on said adapter member and being elongated in a second direction substantially normal to said first direction; and an axle supporting member supporting said axle of said gear wheel, said axle supporting member being engageable with and movable over said second connecting portion, in said second direction so as to be mounted on said adapter member and thereby on said wall of said housing in a position in which said gear wheel meshes with and is driven by said drive screw.

4,094,208

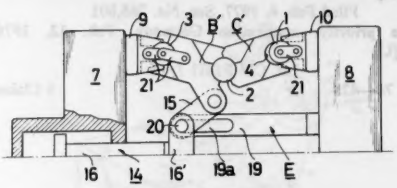
TOGGLE MEANS

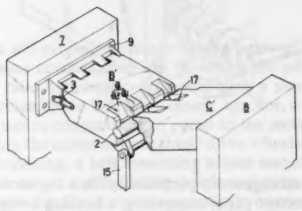
Shigeru Tsutsumi, No. 1165, Toyama-cho, Yonezawa-shi, Yamagata-ken, Japan

Filed Dec. 8, 1975, Ser. No. 638,250
Claims priority, application Japan, Dec. 12, 1974, 49-142018
Int. Cl.² G05G *1/04*
U.S. Cl. 74—520 **6 Claims**

1. Toggle means mounted between two relatively movable members comprising supports on each of said members, cylindrical shaft engageable with each of said supports, said supports having partial circular end portions engaging the respective cylindrical shaft, each of said supports having opposed projections spaced from one another along the transverse width of the respective support, said spaced projections defining spaced, extended circular portions engageable with the respective cylindrical shaft, whereby the respective shaft is engageable by said partial circular end portion and the extended circular portions of the spaced projections of the supports, first compression links engageable with one of said shafts, second compression links engageable with the other of said shafts, a third cylindrical shaft engageable between said

first and second compression links, said compression links having transverse partial circular end portions engaging the respective cylindrical shaft, each of said compression links having opposed projections spaced from one another along the transverse width of said end portions, said spaced projections defining spaced, extended circular portions engageable with the respective cylindrical shaft, whereby the respective shaft is engageable by said circular end portions and the extended





circular portions of the spaced projections of the compression link, said compression links having generally flat and parallel upper and lower faces, said spaced projections on said compression links generally forming continuations of said faces, and means defining sloping surfaces disposed in the spaces between said spaced projections of said compression links, said sloping surfaces extending from said circular end portion of said compression links to the respective face of the compression links.

4,094,209

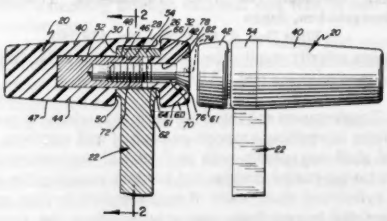
LEVER KNOB

Richard Van Rossem, Canton, and Michael B. Hyde, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 17, 1977, Ser. No. 778,653

Int. Cl.² G05G *1/10*

U.S. Cl. 74—543 **15 Claims**



1. In a knob assembly carried by an end portion of an actuating lever, said knob assembly comprising a pair of shaped members, each member having a projecting portion, said projecting portions being seated in an opening in said end portion of the lever from opposite sides thereof, a fastener extending between said projecting portions of said members to secure said members to opposite sides of said lever, and means extending outwardly from one of said members in overlapping relationship to an exposed end of said lever whereby said end of the lever is protected from contact by the hand of an operator.

4,094,210

KNOB FOR SEAT-ANGLE ADJUSTER OF MOTOR-VEHICLE SEAT

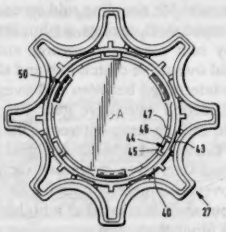
Egon Wirtz, Remscheid-Lennep, and Klaus Berghaus, Wuppertal, both of Germany, assignors to Keiper KG, Remscheid-Hasten, Germany

Division of Ser. No. 544,780, Jan. 28, 1975, Pat. No. 3,976,327, and Ser. No. 572,300, Mar. 28, 1975, Pat. No. 3,966,253. This application Jul. 6, 1976, Ser. No. 702,857

Claims priority, application Germany, Jul. 4, 1975, 7521224[U]

Int. Cl.² G05G *1/10*; B60N *1/02*

U.S. Cl. 74—553 **8 Claims**



1. In combination with an automotive-vehicle seat-angle adjustment device having a pair of hinge parts and means including an adjustment member rotatable about an axis and having a periphery formed with a plurality of radially outwardly open recesses for varying the relative position of said hinge parts, a knob having

an annular collar closely surrounding said periphery,

a plurality of entrainment formations projecting radially inwardly from said collar into respective recesses, and

a plurality of radially outwardly deflectable hooks each engaging axially through a respective recess with said member, said hooks alternating with said formations around said periphery and each having a stem engaging through the respective recess and a hook head engaging behind said member, whereby said hooks and said formations can transmit force angularly between said member and said knob.

4,094,211

HYDRAULIC SYSTEM FOR AN AUTOMATIC TRANSMISSION OF AN AUTOMOTIVE VEHICLE

Helmut Espenschied, Ludwigsburg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 18, 1976, Ser. No. 715,433

Claims priority, application Germany, Aug. 20, 1975, 2537006

Int. Cl.² B60K *41/18*

U.S. Cl. 74—868 **15 Claims**

1. A system comprising:

a source of pressurized fluid;

a pressure-operated load;

an engine having an accelerator pedal;

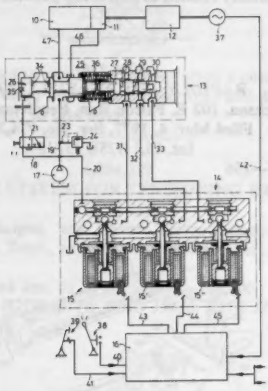
a valve connected between said source and said load and having a valve body displaceable to control the flow of said fluid to said load and having a plurality of binarily stepped pilot surfaces;

means defining a pressurizable chamber at each of said surfaces;

a plurality of solenoid valves each between said load and a respective one of said chambers;

clock means for periodically generating a "shift" signal;

electrical circuit means connected to said pedal and said solenoid valves for electrically energizing said solenoid valves in accordance with pedal position, said circuit means being connected to a source of electricity and being switchable through a plurality of steps, said circuit means being responsive to said "shift" signal and maintaining electrical contact between at least a one of said solenoid



valves and said source of electricity while moving through said steps;

means for generating an output representing engine speed; and

means for comparing said output with a reference value and for generating an error signal controlling said means for generating said "shift" signal.

4,094,212

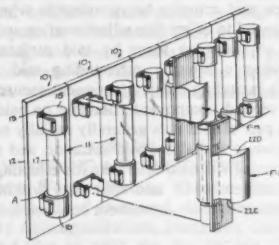
FUSE-MATE

Irving Hyams, Philadelphia; Harold S. Koch, Plymouth Meeting, and Herman Aafjes, Hatfield, all of Pa., assignors to Fischer & Porter Company, Warminster, Pa.

Filed Apr. 7, 1977, Ser. No. 785,526

Int. Cl.² B25B *27/14*

U.S. Cl. 81—3.8 **5 Claims**



1. A fuse mate of insulating material adapted to be coupled to a cartridge-type fuse having a fuse wire disposed within a cylindrical casing whose ends are enclosed by terminal caps, said caps being engageable by the spring clips of a fuse holder, said mate facilitating the insertion or extraction of said fuse and comprising:

A a shield dimensioned to protectively cover said fuse and having a length which is at least equal to that of the fuse so as to overlie the caps and the spring clips;

B a pair of elongated resilient jaws projecting from the underside of said shield, said jaws having an inlet opening which is normally narrower than the diameter of the casing, the inlet opening being dilatable to permit the jaws to clamp onto and to conform to said casing, said jaws having a length substantially shorter than that of said shield so as to be in contact with the casing between said end caps; and

C a block on the outside of said shield forming a handle for said fuse mate, said shield, said jaws and said block being integral with each other and being fabricated from a single molded piece of synthetic plastic material.

4,094,213

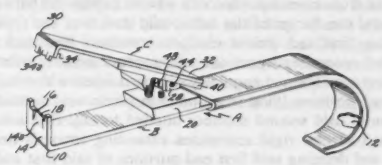
COMBINED WIRE CUTTER AND INSULATION REMOVER

Marion W. Bradley, Magalia, Calif., assignor to Farinon Electric, San Carlos, Calif.

Filed Jul. 18, 1975, Ser. No. 597,238

Int. Cl.² H02G *1/12*

U.S. Cl. 81—9.5 R **1 Claim**



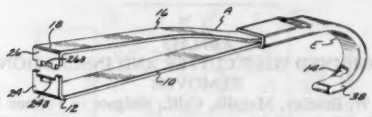
1. A device for stripping a cylindrical electrical insulating sheath that is formed from a highly resilient and compressible material from a wire to expose a bare end portion of the latter that is of predetermined length, said device being of the type that includes: first and second elongate rigid members that each have first and second end portions, said second member overlying said first member; pivot means that pivotally connect said first end portion of said second member to said first member intermediate said first and second end portions of the latter; spring means that at all times tend to maintain said second member in a first angular position relative to said second member, but permitting said second member to be pivoted to a second position where said second end portions of said first and second members lie in a common plane; first and second cutters disposed said predetermined length from said second end portions of said first and second members and so supported from said first and second members as to slidably engage one another as said second member moves from said first to said second position and in so doing cutting said insulation sheath and wire situated therebetween; first and second rigid extensions extending towards one another and defining said second end portions of said first and second rigid members, said first and second extensions including first and second transverse edges of substantial width that are separated by a distance greater than the diameter of said sheath when said second member is in said first position; with said device being characterized by first and second semi-cylindrical aligned recesses formed in said first and second transverse edges of said first and second extensions, said first and second recesses each having a diameter slightly larger than the diameter of said bare wire, and said first and second recesses being of sufficient widths that when said second member is moved to said second position, said first and second recesses compress a cylindrical section of said sheath therebetween to have such a thin wall that said thin wall may be broken and a portion of said sheath that has been cut to said predetermined length by said first and second cutters may be slid from an end portion of said wire that is also of said predetermined length by moving said device longitudinally relative to said wire in an appropriate direction with said second member in said second position; and first and second engageable means on said first and second extensions that slidably interlock to maintain said first and second recesses in alignment as said first and second recesses pressure contact said insulation sheath to form said thin wall cylindrical section.

4,094,214

WIRE INSULATION STRIPPING DEVICE

Marion W. Bradley, Paradise, Calif., assignor to Farinon Electric, San Carlos, Calif.

Filed Jul. 18, 1975, Ser. No. 597,240
Int. Cl.[2] H02G 1/12
U.S. Cl. 81—9.5 R 1 Claim



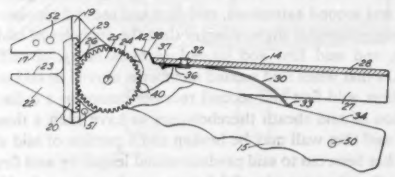
1. A device for stripping a cylindrical electrical insulating sheath that is formed from a highly resilient and compressible material from an end portion of a wire to expose the bare metal electrical conductor of the latter, said device of the type that includes: first and second elongate members that each have first and second end portions, said second member overlying said first member and angularly disposed relative thereto, said first end portions lying in a common plane, said second end portion of said second member bonded to said first member; first and second rigid extensions extending towards one another and defining said first end portions of said first and second rigid members, said first and second extensions including first and second transverse edges of substantial width that are separated by a distance greater than the diameter of said sheath when said second member is in a first position relative to said second member, with said device being characterized by first and second semi-cylindrical aligned recesses formed in said first and second transverse edges of said first and second extensions, said first and second recesses each having a diameter slightly larger than the diameter of said bare wire, and said first and second recesses of sufficient widths that when said second member is moved to a second position relative to said first member, said first and second recesses compress a cylindrical section of said sheath therebetween to have such a thin wall that said thin wall may be broken and a portion of said sheath slid from said wire to expose a bare end portion of the latter when said device is moved longitudinally relative to said wire in an appropriate direction with said second member in said second position; and first and second rigid engageable means on said first and second extensions that slidably interlock to maintain said first and second recesses in alignment as said first and second recesses pressure contact said insulation sheath to form said thin wall cylindrical section.

4,094,215

PLIER WRENCH

Robert H. Hudson, 103 Valley St., Seekonk, Mass. 02771

Filed Apr. 1, 1977, Ser. No. 783,816
Int. Cl.[2] B25B 13/14, 13/22
U.S. Cl. 81—127 2 Claims



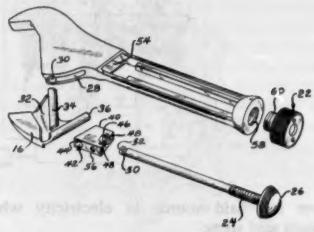
1. A wrench comprising an elongated body portion having a fixed jaw at one end, a movable jaw slidable in said body portion for cooperation with the fixed jaw and having a rack, a gear rotatably mounted on a pin in the body portion meshing with the rack and of a size and at a position to protrude beyond the side of the body portion, a lever pivotally mounted on said pin, said lever having a locking tab in the plane of said gear and with a thumb portion protruding beyond the side of the body portion adjacent said gear and resiliently urged into engagement with said gear so that when the lever is swung toward the body the gear rotates and the rack slides the movable jaw toward the fixed jaw, said gear and said thumb portion being exposed for simultaneous manual engagement by a single finger so that when the tab is disengaged from the gear, the gear may be manually rotated to adjust the position of the movable jaw.

4,094,216

RAPIDLY ADJUSTABLE TOOL

Carl D. Jackson, 102 E. Falcon Run, Pendleton, Ind. 46064

Filed Mar. 4, 1977, Ser. No. 774,333
Int. Cl.[2] B25B 13/16
U.S. Cl. 81—156 7 Claims



1. An adjustable tool comprising:

at least two tool parts, each having a work engaging surface, said parts being interconnected such that said work engaging surfaces are relatively movable;

an elongated rotary and reciprocal, threaded actuator operatively associated with said parts such that upon rotation or reciprocation of said actuator, relative movement between said parts will occur;

a tool base, mounting said parts and said actuator; and

a clutch on said base and receiving said actuator for selectively engaging or disengaging the threads on said actuator, said actuator being substantially freely reciprocable within said base when said threads are disengaged to allow rapid relative movement between said surfaces to occur to effect rapid adjustment of the relative positions of said surfaces, said actuator being rotatable when said threads are engaged to effect fine adjustment or and/or the application of clamping force by said surfaces, said clutch comprising a housing surrounding said actuator, said housing including a first component secured to said base and a second component rotatable on said first component, a pair of split nuts generally radially movable within said housing and about said actuator, and cam means on said housing and said split nuts for effecting bidirectional radial movement of said split nuts within said housing upon relative rotary movement between said components.

4,094,217

SAFETY SLITTER FOR THERMOPLASTIC SHEET

Roger Edsel Exline, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 28, 1977, Ser. No. 810,696
Int. Cl.[2] B26D 3/08
U.S. Cl. 83—6 1 Claim

1. An improved, automatically retractable safety slitter for cutting thermoplastic sheet as it exits from the sheet die of an extruder comprising a housing, a cutter blade mounted in a holder, a recess in said housing of a length greater than the length of said holder for slidably and retractably receiving said holder, an elongated slot in said housing having detent means, an elongated pin secured to said holder and extending transversely through said elongated slot, tension spring means be-

tween said holder and said housing adapted to be relaxed when said holder is in its retractable position within said recess, said

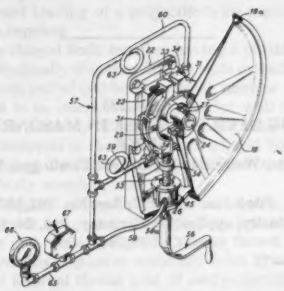
pin being adapted to rest in said detent when a cutting force is applied to said blade and to disengage from said detent when no force is applied to said blade.

4,094,218

HYDRAULIC SYSTEM FOR TENSIONING BAND SAW BLADES

Richard J. Flanigan, and Robert Duane Hooton, both of McMinnville, Tenn., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,000
Int. Cl.[2] B27B *13/14;* B23D *55/10;* B27B *13/08*
U.S. Cl. 83—62.1 **15 Claims**



1. In a machine having spaced wheels driving a band trained therearound and at least one wheel being shiftable relative to another wheel to control tension of the band, the improvements of a closed hydraulic conduit having fluid sealed therein, adjustable means supported on fluid from said conduit adapted to be set to position said one wheel and simultaneously load said sealed fluid, hydraulic brake means for said one wheel biased to open position with loaded fluid from said conduit, and means biasing said brake means to closed position for stopping rotation of said one wheel whenever fluid pressure in said conduit falls below a predetermined minimum.

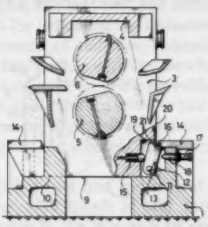
4,094,219

SHEARING ARRANGEMENT

Wolfgang Fabian; Werner Plumer; Theodor Sevenich, and Heribert Zehnter, all of Dortmund, Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Germany

Filed May 16, 1977, Ser. No. 797,062
Claims priority, application Germany, May 20, 1976, 2622558
Int. Cl.[2] B26D *1/40, 7/26*
U.S. Cl. 83—345 **10 Claims**

1. A shearing arrangement for cutting moving bars, comprising: shear stands; two counter-rotating knife drums rotatable in said shear stands; a base plate; said shear stands being spaced from each other and being located on said base plate; a disconnectable yoke, said shear stands being connected to each other above said knife drums by said disconnectable yoke; said two knife drums being mounted directly in said shear stands, each shear stand being a single piece member; quick-disconnect coupling means, said shear stands being inserted into said base plate and being connected to said base plate by said quick-disconnect coupling means; said coupling means engaging recesses at the bottom of said shear stands, said coupling means having elements brought together by weight of said shear stands when installing said shear stands into said base plate;



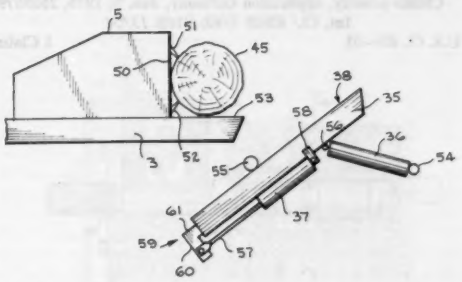
spring means; said elements of said coupling means being spread by said spring means after said shear stands have been installed into said base plate, the spreading of said elements being increased by an upward force which can develop during a shearing process so that said shear stands are prevented from tilting in said base plate; and means in said base plate for relieving pressure on said elements before said shear stands are lifted from said base plate.

4,094,220

SAWMILL METHOD AND APPARATUS

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Filed May 16, 1974, Ser. No. 470,338
Int. Cl.[2] B27B *31/02, 31/04*
U.S. Cl. 83—712 **11 Claims**



1. Apparatus for manipulating a sawlog and the like, comprising

an elongate striking member arcuately movable about a pivot point adjacent one end thereof and to and from abutting engagement with said sawlog and further having a sidewall aperture adjacent the other end thereof directed generally toward said sawlog,

an elongate support member longitudinally movable in said striking member to and from said aperture therein, and

log engaging member pivotally mounted on said support member for rotation between a first position extending through said sidewall aperture in said striking member toward said sawlog and a second folded position within said striking member and displaced from said sidewall aperture.

4,094,221

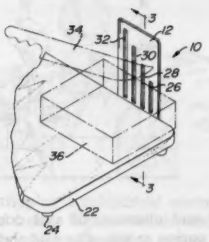
CUTTING BOARD ATTACHMENT

Charles E. Jacoby, 2142 Covington Ave., Bethlehem, Pa. 18017

Filed Oct. 12, 1976, Ser. No. 731,264
Int. Cl.[2] B26D *4/42*
U.S. Cl. 83—762 **7 Claims**

1. Apparatus for attachment to a support surface to facilitate the use of a discrete knife as a lever for cutting hard objects

comprising a fulcrum support member, said member being a L-shaped plate with one leg adapted to be vertically disposed along side a cutting block, means on the other leg of said member for facilitating attachment of said member to a cutting block, means on said one leg providing a plurality of discrete



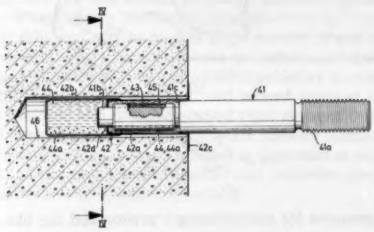
fulcrums at different elevations for contact with the upper edge of a cutting blade while receiving therein the tip of the blade so that the cutting blade can be used as a lever pivotable downwardly about the fulcrums during a cutting action, said fulcrums being spaced transversely across the width of said one leg of said support member.

4,094,222

ADHESIVELY SECURED ANCHOR BOLT

Gusztav Lang, Nüremberg, and Wolf Kuhlmann, Munich, both of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jun. 4, 1976, Ser. No. 692,929
Claims priority, application Germany, Jun. 9, 1975, 2525579
Int. Cl.[2] E04B *1/48;* F16B *13/04*
U.S. Cl. 85—63 **1 Claim**



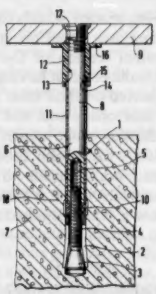
1. An anchor assembly comprising an anchor bolt and an adhesive material for securing the anchor bolt in a prepared borehole, the adhesive material comprising at least a first component and a second component with one of said components effecting the hardening action when they are mixed together, a cartridge containing one of said first and second components, said cartridge formed of a destructible material, wherein the improvement comprises that said anchor bolt has an axially extending shank, at least a portion of the other one of said first and second components disposed on said shank, a destructible protective sheath enclosing said at least one portion of the other one of said first and second components deposited on said shank, said shank having a first end arranged to be inserted first into the prepared borehole and an oppositely directed second end, a collar formed on said shank intermediate the first and second ends thereof, said collar extending radially outwardly from said shank transversely of the axial direction thereof, said cartridge having an inner surface spaced outwardly from said shank and the outer circumferential periphery of said collar disposed in continuous contact with the inner surface of said cartridge, said shank has a first portion extending from the first end of said shank toward the second end thereof to a point intermediate the ends of said shank and a second portion extending from the end of said first portion intermediate the ends of said shank toward the second end of said shank, said first and second portions being co-axial and said second portion having a larger diameter than said first portion, said collar being formed on the end of said second portion connected to said first portion said protective sheath located on said first portion of said shank, said cartridge laterally enclosing said first portion of said shank and extending in the axial direction of said shank from the first end of said shank away from the second end thereof, a stripping plate mounted on the first portion of said shank adjacent the first end thereof and extending transversely of the axial direction of said shank, said cartridge comprising a cap laterally enclosing said stripping plate and extending in the axial direction of said shank from the first end of said shank away from the second end thereof, and a sleeve secured to said stripping plate radially outwardly from the said first portion and laterally enclosing said first portion of said shank and fitted closely about the end of the second portion of said shank adjacent to said first portion, and the opposite end of said sleeve from said stripping plate having a radially outwardly directed flange extending transversely of the axis of said shank and said flange arranged to extend outwardly beyond the diameter of the prepared borehole into which the anchor assembly is inserted.

4,094,223

MOUNTING DEVICE FOR USE IN MASONRY AND THE LIKE

Artur Fischer, Weinhalde 34, D-7244 Tumlingen, Waldachtal 3, Germany

Filed Jan. 21, 1977, Ser. No. 761,537
Claims priority, application Germany, Jan. 24, 1976, 2602635
Int. Cl.[2] F16B *13/06*
U.S. Cl. 35—77 **11 Claims**

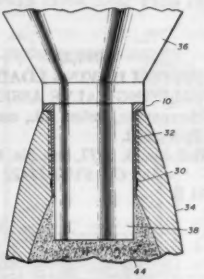


1. A mounting device in combination with a masonry structure and the like, comprising an expandable member received in a hole of said structure; an expander member adapted to expand at least a leading end of said expandable member; a shaft member having a first portion located in said hole and connected with said expander member, and a second portion outwardly projecting from said hole in a first direction from said structure towards an object being mounted and carrying said object at a distance from said structure; and a sleeve-shaped element of a corrosion-resistant material enclosing said first portion of said shaft member located in said hole and also enclosing said second portion of said shaft member outwardly projecting from said hole over a length corresponding to said distance, said sleeve-shaped element having a section abutting against said object to keep it at said distance from said structure.

4,094,224
THREAD PROTECTOR AND SEAL

Joseph C. Homko, Oxford, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 20, 1977, Ser. No. 817,305
Int. Cl.[2] F42B *33/02*
U.S. Cl. 86—31 7 Claims



1. A thread protector and seal device for use in automated nose end funnel loading of a projectile with explosive materials, which comprises:

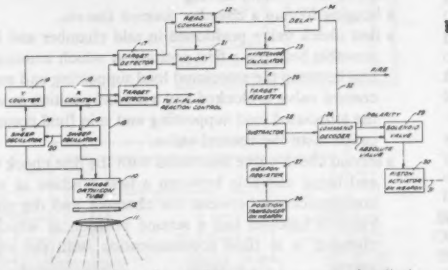
a tubularly shaped body member having a plurality of parallel longitudinally disposed flexing slots extending through the bottom end of said body member, annular seal grooves disposed in an interior and an exterior wall of said body member, a plurality of transversely disposed seal through holes positioned in the bottom end of said body member, and an integrally disposed flange located on an upper end of said body member; and

molded compliant means located in said interior and exterior seal grooves for preventing injury to internal threads in the nose end of said projectile during funnel loading and for preventing explosive materials from flowing upward into said internal thread area of said projectile.

4,094,225
TARGET DETECTING AND LOCATING SYSTEM

Eugene C. Greenwood, 468 Prospect 250 Colton, Newport Beach, Calif. 92660

Filed Feb. 3, 1969, Ser. No. 795,844
Int. Cl.[2] H04N *3/00*
U.S. Cl. 89—41 L 14 Claims



13. A system for detecting and locating a source of radiation comprising:

detector means sensitive to incoming radiation for generating a signal indicative of the receipt thereof;

filter means positioned between said source and said detector means for passing radiation of only a selected frequency;

means for scanning said detector means along first and second orthogonal axes;

means responsive to said scanning means for generating first and second signal indicative of the instantaneous scan direction of said detector means along said first and second orthogonal axes, respectively; and

utilization means responsive to the occurrence of a radiation indicating signal and said first and second direction indicating signals for indicating the instantaneous direction to a received source of radiation, wherein said system is operative to aim a weapon in the direction of said source of radiation, said weapon being movable in two orthogonal directions under the control of a pair of variable members connected between first and second stationary points and said weapon, and wherein said utilization means comprises:

means responsive to said first and second signals for determining the required length of said variable members to aim said weapon in the direction of said source and for generating third and fourth signals indicative thereof;

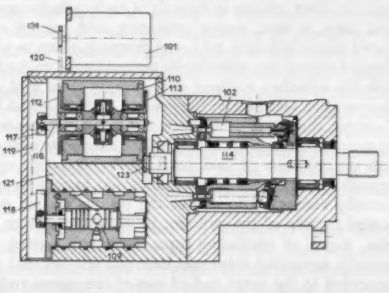
means for generating fifth and sixth signals indicative of the instantaneous actual length of said variable members; and

means responsive to said third through sixth signals for determining the difference between the actual and required lengths of said members and for generating an error signal as a function thereof, said weapon adapted to be moved to reduce said error signal to zero.

4,094,226
HYDRAULIC CONTROL APPARATUS WITH FEEDBACK

Jacques Faisandier, 32 Bd Felix Faure, 92320 Chatillon-sur-Bagneux, France

Filed May 25, 1976, Ser. No. 689,796
Claims priority, application France, May 26, 1975, 75 16265
Int. Cl.[2] F15B *9/12*
U.S. Cl. 91—39 5 Claims



1. A hydraulic control apparatus having a mechanical feedback system, said apparatus comprising:

means providing an input signal in the form of a shaft rotation;

hydraulic motor means for generating an output signal commensurate with said input signal, said output signal being in the form of a change in the position of an output shaft of said hydraulic motor means;

differential comparator means for comparing said input and output signals, said comparator means including a pair of differential gears and bevel gear means coupled to two said differential gears, said comparator means also including a rotatable output shaft on which said bevel gear is mounted;

valve means for controlling the delivery of operating fluid to said hydraulic motor;

first transmission means connecting said input signal generating means to one of said differential gears of said comparator means;

second transmission means coupling the output shaft of said hydraulic motor means to the other of said differential gears of said comparator means;

first crank means, said first crank means including an adjust-

able length first crank arm connected at a first end to the output shaft of said comparator means;

second crank means, said second crank means including a second adjustable length crank arm connected at a first end to said valve means for effecting control of said valve means; and

connecting rod means interconnecting the second ends of said first and second crank arms of said first and second crank means.

4,094,227

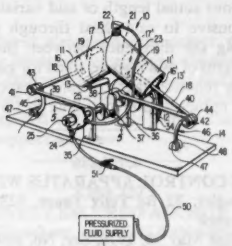
FLUID MOTOR

Samuel A. King, P.O. Box 6, Alturas, Fla. 33820

Filed Jun. 6, 1977, Ser. No. 803,934

Int. Cl.[2] F01L *33/02*; F01B *7/04*

U.S. Cl. 91—180 **3 Claims**



1. An opposed piston fluid motor comprising a pair of angularly related cylinders having adjacent ends rigidly joined in a common plane oblique to the axis of each cylinder and remote open ends, a base, means mounting said pair of cylinders spaced above said base with said common plane in which the adjacent ends of the cylinders lie perpendicular to the base, and with the cylinders inclined downwardly from said common plane toward said base in the manner of an inverted V, a pair of pistons, there being a different one of said pistons reciprocably mounted in each of said cylinders, a separate piston rod for each piston, each of said piston rods extending outwardly through the open end of a cylinder and having an inner end pivotally connected to one of the pistons and an outer end located outside of the cylinder in which the piston reciprocates, a pair of oscillating arms, each arm having one end pivotally supported from said base and another end pivotally connected to the outer end of one of the piston rods, means mounting each of said oscillating arm to oscillate about an axis parallel to said common plane and in a plane normal to said common plane, a crank shaft, means rotatably mounting said crankshaft above said base to rotate about an axis parallel to said base and lying in said common plane, said crankshaft having a pair of axially displaced cranks, angularly displaced 180° from each other, a pair of connecting rods having opposite ends, one of said connecting rods having one end pivotally connected to one of said cranks and an opposite end pivotally connected to the pivot connection between one of said piston rods and one of the oscillating arms, the other connecting rod having one end pivotally connected to the other of said cranks and having an opposite end pivotally connected to the pivot connection between the other of said piston rods and the other of said oscillating arms, a fly wheel mounted on said crankshaft to rotate therewith, said pistons each having a working face, the working faces of said pair of pistons facing each other within said cylinders, an expansible working chamber within said cylinders between the working faces of the pistons, a fluid port communicating with said expansible working chamber at the adjacent ends of said cylinders, a fluid control valve means for cylically admitting pressurized fluid to said expansible working chamber and exhausting exhaust fluid from said expansible working chamber, and fluid conduit means connecting said fluid control valve means with said fluid port, said control valve means being operatively connected to said crankshaft.

4,094,228

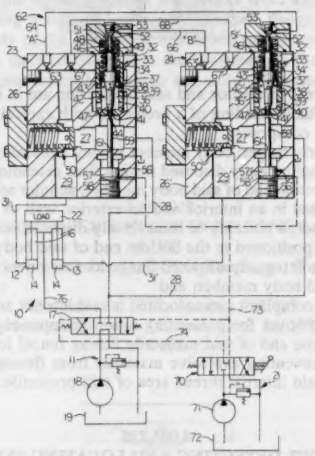
FLUID SYSTEM HAVING LOAD PRESSURE EQUALIZING VALVE ASSEMBLIES

Lawrence F. Schexnayder, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 6, 1977, Ser. No. 804,195

Int. Cl.[2] F15B *11/22*

U.S. Cl. 91—411 B **11 Claims**



1. In a fluid system having a source of fluid, a control valve, first and second hydraulic jacks each having a load supporting end connected to the source of fluid through the control valve, the improvement comprising:

first and second pilot operated valve assemblies positioned between the control valve and the load supporting ends, each vavle assembly having

a housing having a chamber formed therein,

a first check valve positioned in said chamber and being movable between a first position at which communication between the associated load supporting end and the control valve is blocked and a second position at which the associated load supporting end is in fluid communication with the control valve,

a second check valve associated with the first check valve and being movable between a first position at which communication between the chamber and the control valve is blocked and a second position at which the chamber is in fluid communication with the control valve,

first piston means for urging the second check valve toward the first position, and

second piston means for initially moving the second check valve to the second position and for subsequently moving the first check valve to the second position; and

signal means for sensing the load pressure in the load supporting ends and for delivering first and second control signals to the first piston means of the respective first and second valve assemblies.

4,094,229

FLUIDIC REPEATER

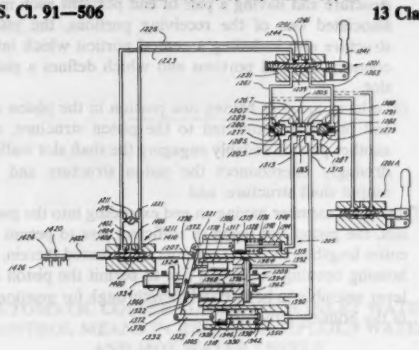
Willie B. Leonard, 5902 Royalton, Houston, Tex. 77036

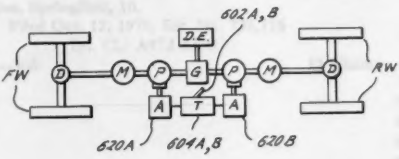
Continuation-in-part of Ser. No. 521,036, Nov. 5, 1974, Pat. No. 4,046,059, which is a continuation-in-part of Ser. No. 489,829, Jul. 18, 1974, Pat. No. 3,988,966. This application Oct. 15, 1975, Ser. No. 622,760

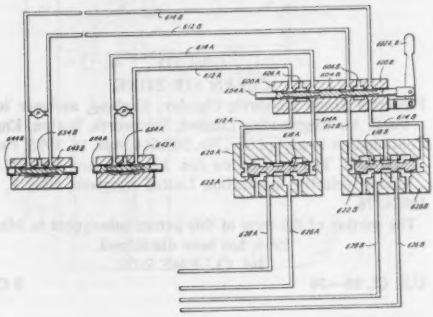
The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

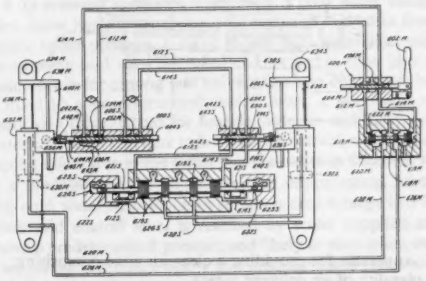
Int. Cl.[2] F01B *13/04, 3/02;* F15B *13/16*

U.S. Cl. 91—506 13 Claims









1. Fluidic repeater comprising:

transmitter means for providing fluid at variable pressure, said transmitter means including a first transmitter having (a) passage means for conveying the variable pressure fluid and from which the variable pressure fluid is provided, (b) source connection means for connecting said passage means to a source of pressurized fluid, (c) restrictor means for restricting fluid flow from said source connection means to said passage means so that fluid supplied to said passage means from such source has a drooping pressure versus rate of flow characteristic, (d) transmitter reservoir connection means for connecting said passage means to a rservoir means having a pressure less than that of such source, and (e) transmitter obstructor means for variably obstructing flow through said transmitter reservoir connection means;

a responder including

(a) an output member,

(b) primary means for providing a supply of fluid, said primary means including a primary cylinder and a primary piston movable axially in said primary cylinder, said primary cylinder being connected to said passage means for relative axial movement of said primary piston and primary cylinder in response to variation in the pressure of the fluid of said transmitter passage means, the supply of fluid being in accordance with the relative positions of said primary cylinder and primary piston, and

(c) secondary means for mechanically displacing said output member in an amount dependent upon the supply of fluid provided by said primary mans, said secondary means including a plurality of secondary cylinders each such secondary cylinder connected to said primary means and having a secondary piston movably disposed therein; and

feedback means for variably venting fluid from said passage means to the reservoir means having a pressure less than that of the source to stop displacement of said output member, the extent of venting of said feedback means being variable according to the position of at least one of the secondary pistons of said responder with respect to the secondary cylinder within which such one of the secondary pistons is disposed and being independent of the time rate of the displacement of said output member, said feedback means including feedback reservoir connection means for connecting said passage means to the reservoir means and feedback obstructor means for variably obstructing flow through said feedback reservoir connection means,

a portion of said feedback reservoir connection means being separate from a portion of said transmitter reservoir connection means at least to the extent tht the flow obstructed by said feedback obstructor means is separate from the flow obstructed by said transmitter obstructor means.

4,094,230

SELF-ALIGNING AND END FIXITY CONNECTOR FOR CONNECTING A HYDRAULIC CYLINDER PISTON ROD TO ITS RESPECTIVE SECTION IN A MULTI-SECTION TELESCOPIC BOOM ASSEMBLY

William E. Wright, and Huber D. Bock, Jr., both of Hagerstown, Md., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

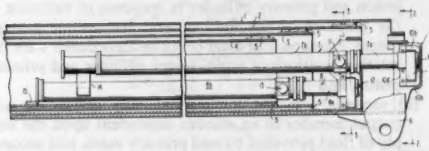
Continuation of Ser. No. 511,606, Oct. 3, 1974, abandoned. This application Jan. 18, 1977, Ser. No. 760,323

Int. Cl.[2] F01B *7/20, 1/00*

U.S. Cl. 92—51 6 Claims

1. A self-aligning and end fixity connector for connecting a hydraulic cylinder piston rod to its respective section in a

multi-section telescopic boom assembly comprising, a hydraulic cylinder mounted within one section of a multi-section boom assembly, a member connected to the cylinder and trunnioned to the boom section for pivotal movement only relative thereto, a piston rod slidably mounted in said cylinder, a piston on one end of said rod disposed within said cylinder, a block member rigidly connected to the free end of said piston rod, a pair of spaced, parallel, depending plate members secured to the side faces of said block, said depending plate members being positioned adjacent the inwardly facing surfaces of the side walls of another section of said multi-section boom assembly, a rectangular frame member having integral end and side walls secured to each inwardly facing side wall, each rectangular frame member and the respective inwardly facing side wall forming a recess receiving a respective depending plate member, each depending plate member on the free end of the piston rod being rectangular, the side edges of each depending plate member engaging the corresponding side edges of the frame to prevent rotation of the piston rod about a horizontal transverse axis, the end edges of each depending plate member being spaced from the corresponding ends of the frame member to thereby provide a clearance for permitting a floating action of the rod in a vertical plane only, whereby the connection points of the cylinder and piston to their respective boom sections are maintained in alignment with each other, with the opposite ends of the piston rod substantially fixed against rotational movement about a horizontal transverse axis, thereby increasing the column loading capacity of the rod and associated boom section.



4,094,231

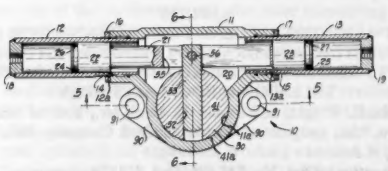
ROTARY ACTUATOR AND METHODS OF FABRICATION

Paul Carr, Massillon, Ohio, assignor to Flo-Tork, Inc., Orrville, Ohio

Continuation-in-part of Ser. No. 477,763, Jun. 10, 1974, abandoned. This application Jun. 2, 1975, Ser. No. 582,401

Int. Cl.² F01B 9/00

U.S. Cl. 92—128 **5 Claims**



1. A fluid actuator, comprising:

(a) a housing structure defining a pair of spaced piston receiving portions and a communicating chamber;

(b) the housing having an opening communicating with one of the receiving portions;

(c) an output shaft structure journalled in the housing structure and having a slotted portion positioned in the chamber;

(d) the slotted portion including walls which define a shaft slot;

(e) a piston and lever assembly including:

(i) a piston structure movably carried by the housing structure and having a pair of end portions each in an associated one of the receiving portions, the piston structure also including a central portion which interconnects the end portions and which defines a piston slot;

(ii) a lever member having one portion in the piston slot and pivotally connected to the piston structure, and another portion slidably engaging the shaft slot walls to drivingly interconnect the piston structure and the output shaft structure; and

(f) the lever member having an end extending into the piston slot, the piston slot being of sufficient size to permit the entire length of the lever member to be nested therein, the housing opening being of a size to permit the piston and lever assembly to be inserted therethrough for positioning in the housing structure.

4,094,232

CLEAN AIR ZONE

Frederick Hugh Howorth, Chorley, England, assignor to Howorth Air Engineering Limited, Farnworth, Bolton, England

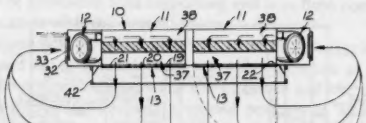
Continuation-in-part of Ser. No. 568,614, Apr. 16, 1975, Pat. No. 4,009,647. This application Jan. 13, 1977, Ser. No. 758,926

Claims priority, application United Kingdom, May 8, 1976, 19024/76

The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.² F24F 9/00

U.S. Cl. 98—36 **9 Claims**



2. Apparatus for providing a clean air zone comprising:

a plurality of air delivery means,

a plurality of air supply means for supplying sterile air to the air delivery means,

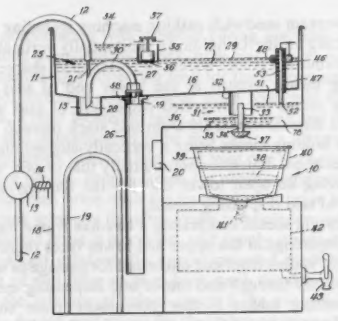
a first central one of the air delivery means being adapted to supply air at a first velocity,
and a second outer one of the air delivery means being adapted to supply air at a second velocity lower than the first velocity,
the different air delivery means having different permeabilities for attaining the desired flow velocity differential.

4,094,233

AUTOMATIC COFFEE MAKER WITH INLET WATER CONTROL MEANS IN RESPONSE TO COLD WATER AND HOT WATER LEVELS

John C. Martin, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Oct. 12, 1976, Ser. No. 731,716
Int. Cl.² A47J *31/00*
U.S. Cl. 99—305 **11 Claims**



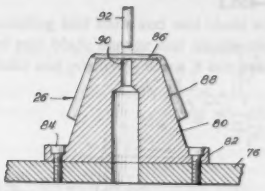
1. In brewing apparatus comprising, a cold water basin, an inlet water line for supplying cold water to said basin from a source under pressure, a valve in said inlet water line, means for opening said valve to cause cold water to flow into said basin, means for closing said valve when said cold water basin is filled to a predetermined shutoff level, a hot water tank under said basin, means for heating water in said tank, a cold water inlet from said tank to brew coffee extract, and means for closing said valve in the event that the water in said tank rises to a predetermined level therein, the improvement wherein said cold water inlet includes siphon means arranged to start when said shutoff level is reached by water supplied at or above a predetermined pressure and likely to start when water is supplied at a pressure below said predetermined pressure and said shutoff level is not reached whereby water continues to flow into said tank, said means for withdrawing hot water from said tank includes siphon means, and said means for closing said valve includes probe means adapted to be energized by water in said basin and water in said tank respectively.

4,094,234

FILTER PAPER CUP FOR A PERCOLATOR AND PROCESS FOR MAKING THE SAME

Wallace E. Olney, and Robert G. Wright, both of Portage, Mich., assignors to Brown Company, Kalamazoo, Mich.

Filed May 13, 1976, Ser. No. 686,111
Int. Cl.² A47J *31/08*
U.S. Cl. 99—310 **6 Claims**



1. In a percolator for brewing coffee comprising a cylindrical basket concentric with a tubular wand, the combination therewith of a filter paper cup having a flat annular bottom coextensive with and lying flat on the bottom of said basket and having an integral upstanding steam and heat-set sidewall only at the outer periphery of said annular bottom, said upstanding sidewall being fluted with accordian pleat-type flutes and said flutes being under compression by the fact that said upstanding sidewall normally flares outwardly when unconfined by said basket, but is constrained to a vertical position by said basket, in which the filter paper is composed essentially of bleached cellulose fiber from chemically processed wood pulp, is uncalendered, is unsized, is creped from about 6 to about 15 percent, and has a basis weight between about 28 and about 40 pounds, in which the sidewalls of the filter cup have at least 1 flute every 15°, and in which said flutes are steam and heat set by heating the cups to a temperature of about 400° to 420° F to a moisture content between about 3 and about 6 percent while the sidewall is constrained in a cylindrical position, and substantially only the outermost apices of said flutes are substantially entirely in contiguous relationship with the inner wall of said basket into which said paper filter cup is placed.

5. A filter paper cup adapted for use in a percolator having a cylinderical basket concentric with a tubular wand comprising an annular bottom having an integral upstanding steam and heat-set wall only at the outer periphery of said annular bottom, said upstanding wall flaring outwardly and being fluted with accordian pleat-type flutes, and in which the filter paper is composed essentially of bleached cellulose fiber from chemically processed wood pulp, is uncalendered, is unsized, is creped from about 6 to about 15 percent, and has a basis weight between about 28 and about 40 pounds, in which there is at least one flute for every 15°, and in which said flutes are steam and heat set by heating the cup to a temperature of about 400° to 420° F, steaming with moist steam of about 90 percent quality, and then dried at a temperature of about 400° to 420° F to a moisture content between about 3 and about 6 percent while the sidewall is constrained in a cylindrical position, the outermost apices of said flutes being rectilinear so that, when the filter cup is inserted into the cylindrical basket of said percolator with the annular bottom of said filter cup being

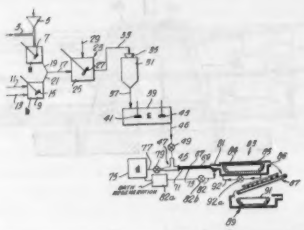
coextensive with and resting on the bottom of said basket and extending from said tubular wand to the outer wall of said cylindrical basket, substantially only the outermost apices of said flutes will be in substantially entirely contiguous relationship with said inner wall.

4,094,235

APPARATUS FOR THE PRODUCTION OF TEXTURED PRODUCTS

Francois Castaigne, Cap Rouge; Marcel Boulet, Ste-Foy; Rene R. Riel, Ste-Foy, and Eric Liber, Ste-Foy, all of Canada, assignors to Universite Laval, Sainte-Foy, Canada

Filed Jul. 31, 1974, Ser. No. 493,455
Int. Cl.[2] A23J *3/00*
U.S. Cl. 99—450.1 **1 Claim**



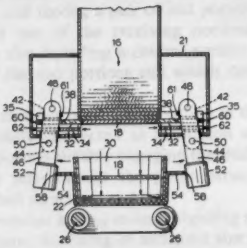
1. Apparatus for producing protein fibers which comprises
(a) a first mixer for producing a dispersion of sodium alginate,
(b) a second mixture for producing a dispersion of proteins,
(c) a third mixer for mixing the two dispersions obtained in (a) and (b),
(d) ducts to feed said two dispersions into said third mixer,
(e) a disintegrator for homogenizing said two dispersions and for breaking off small lumps therein, and a duct to connect said third mixer to said disintegrator,
(f) a ballast tank to receive homogenized dispersion from said disintegrator and a duct to connect said ballast tank to said disintegrator,
(g) a pump connected to said ballast tank by means of a duct,
(h) at least one spinning tube leading away from said pump, and a spinneret at the end of said spinning tube,
(i) a T-shaped tubular member provided with a first, a second, and a third opening, said spinning tube extending through the first opening inside the T-shaped tubular member and thereafter bending towards the second opening of said T-shaped tubular member,
(j) said second opening being provided with a coagulating tube for each spinning tube, the end of said spinning tube with said spinneret inserted inside said coagulating tube,
(k) a tank to contain a coagulation liquid and a duct and pump assembly to feed said coagulating liquid through said third opening into said T-shaped tubular member,
(l) a slowing down unit to receive filaments which have been precoagulated and picked up in said coagulating tubes, said slowing down unit to prevent crushing of the filaments in the next unit,
(m) said next unit comprising a coagulation bath and a conveyor in said coagulation bath for moving the filaments along therein and providing a final coagulation thereof, and
(n) a duct to recirculate the coagulating bath in said tank defined in (k) and means along said duct for monitoring and regenerating acids and salts in said coagulating bath.

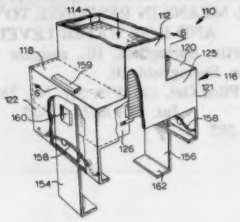
4,094,236

ICE-CREAM SANDWICH FORMING APPARATUS

Gordon W. Holmes, Mississauga, and Roy W. Nelham, Cheltenham, both of Canada, assignors to R. Nelham & Associates Incorporated, Willowdale, Canada

Filed Sep. 7, 1976, Ser. No. 720,576
Int. Cl.[2] A23P *1/00*; B65G *59/06*
U.S. Cl. 99—450.4 **4 Claims**





1. An ice-cream sandwich making machine including
stack holding means for holding a substantially vertical stack of face-abutting edible wafers of rectangular shape;
dispensing means located at the lower end of said stack holding means for controlled dispensing of said wafers one at a time downwardly from said stack thereof;
said stack holding means being a vertically-aligned chute of cross-sectional dimension substantially that of said wafers and having an open lower end for the feeding of said wafers to said dispensing means;
said dispensing means comprising a box-like frame member having openings in the upper and lower faces thereof for receipt of wafers from said chute and for passage of wafers downwardly through and out of said dispensing means;
said dispensing means further comprising plate support means located in said frame member and first and second pairs of plate means;
each member of said pairs of plate means being mounted for sliding movement in said support means, the individual members of each pair being in horizontal alignment;
one member of the first pair of plates being vertically spaced above the one member of said second pair a distance slightly greater than the thickness of one of said wafers and the other member of the first pair of plates being vertically spaced above the other member of said second pair a distance slightly greater than the thickness of one of said wafers,
first spring biasing means operatively associated with each member of said first pair of plates for biasing said first pair of plates towards each other to suspend said stack of wafers,
spring engaging means engaging said first spring biasing means at the end thereof remote from said first pair of plates,
second spring biasing means operatively associated with each of said spring engaging means for biasing said spring

engaging means away from each other and the respective member of said first pair of plates to cushion the force applied to said first pair of plates by said first spring biasing means upon movement of said spring engaging means into greater biasing relationship with said first spring biasing means,

third spring biasing means operatively associated with each member of said second pair of plates normally biasing said second pair of plates away from each other; and

actuation means operably associated with said dispensing means.

4,094,237

APPARATUS FOR THE TREATMENT OF BRINE

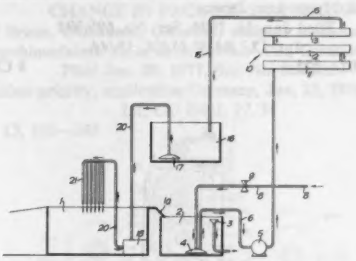
Patrick Brian Riordan, 92 Roselawn, Castleknock, Dublin, Ireland

Filed Dec. 12, 1975, Ser. No. 640,144

Claims priority, application Ireland, Dec. 12, 1974, 2564/74; Feb. 25, 1975, 390/75

Int. Cl.² A23L *3/28*

U.S. Cl. 99—451 **5 Claims**



1. In combination with a bacon curing machine, apparatus for treating contaminated brine from said bacon curing machine comprising a collecting tank for the contaminated brine, means for directing contaminated brine from said machine to said tank, a filter located in said collecting tank and adapted to receive said contaminated brine and having a filtrate outlet in fluid connection with the inlet of at least one ultra-violet liquid irradiating device, supply means for mixing substantially contaminated fresh brine with the contaminated brine in the collecting tank whereby the ultra-violet transmission value of the contaminated brine is increased, said supply means directing a stream of said substantially uncontaminated fresh brine onto the back of said filter so as to back-wash the filter, means for passing the mixture of brines through the ultra-violet liquid purifying device, and means for thereafter returning the irradiated brine to said bacon curing machine.

4,094,238

LETTUCE HARVESTER

Charles D. Striplin, Concord, Calif., assignor to Striplin Machine & Engineering Company, Benecia, Calif.

Filed Oct. 20, 1975, Ser. No. 623,969

Int. Cl.² A23N *15/00*

U.S. Cl. 99—643 **1 Claim**

1. A lettuce trimming machine for trimming the stem of a lettuce head substantially even with the bottom of the head comprising in combination:

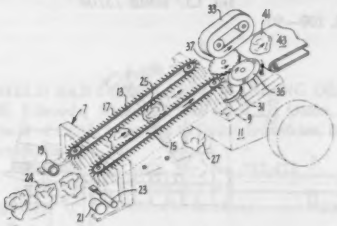
a. a pair of counterrotating flat guage wheels separated by about the width of a lettuce stem,

b. a crowder belt mounted over said guage wheels,

c. means for rotating said guage wheels and said crowder belt in synchronism whereby a lettuce head is propelled forward with the bottom of the head pressed firmly against said guage wheels,

d. a rotary cutting knife mounted adjacent said guage wheels,

e. an impaling blade mounted for rotation substantially even the said rotary cutting knife, said impaling blade having sharp teeth inclined in the direction of rotation,



f. means for rotating said knife and said blade whereby,

g. the teeth of said blade engage and impale the stem of a head of lettuce and positively force it into said knife.

4,094,239

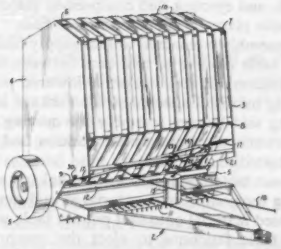
APPARATUS FOR CUTTING HAY BALER TWINE

John Leroy Murr, R.F.D., Laplata, Mo. 63549

Filed Oct. 1, 1976, Ser. No. 728,523

Int. Cl.² B65B *13/02*

U.S. Cl. 100—5 **8 Claims**



1. An apparatus for wrapping a large round bale formed in a large round bale forming machine comprising:

a. frame means of said large round bale forming machine;

b. means operably associated with said frame means for containing a supply of wrapping material;

c. a material directing member adapted to dispense said material;

d. means for mounting said member to said frame means in the vicinity of said large round bale;

e. means operably associated with said member for moving said member whereby material is dispensed from said member along a path in the vicinity of the round bale under conditions wherein said member is moving in such way as to feed said material around said bale;

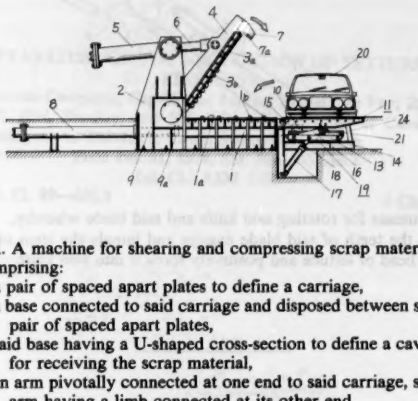
f. cutting means having no moving parts positioned along said path for cutting said material solely upon said material being directed against said cutting means by said directing member, said material being fed unimpededly from said supply to said material directing member and unimpededly from said member to said bale for wrapping.

4,094,240

MACHINE FOR SHEARING AND COMPRESSING SCRAP METALS

Masao Suzuki, 880 Sezaki-cho, Soka-shi, Saitama-ken, Japan

Filed Jul. 9, 1976, Ser. No. 703,761
Claims priority, application Japan, Apr. 8, 1976, 51-042563
Int. Cl.[2] B30B *15/08*
U.S. Cl. 100—97 **5 Claims**



1. A machine for shearing and compressing scrap materials comprising:
- a pair of spaced apart plates to define a carriage,
- a base connected to said carriage and disposed between said pair of spaced apart plates,
- said base having a U-shaped cross-section to define a cavity for receiving the scrap material,
- an arm pivotally connected at one end to said carriage, said arm having a limb connected at its other end,
- a drive motor means connected to said arm for driving said arm toward and away from said base,
- complementary blades connected to said arm and to said base along the respective edges thereof to effect a shearing action on the material adapted to be supported on said base as said arm is pivoted toward said base,
- a ram slideably mounted along said base,
- a drive means for actuating the drive of said ram for successively compressing said material between said ram and said limb, and ejecting said compressed material,
- a supply table pivotally mounted to said base,
- a linkage assembly connected to said supply table for pivoting said table relative to said base between an operative raised position and an inoperative lowered position,
- an actuating means connected to said linkage assembly for activating said linkage assembly for moving said supply table between operative raised position and inoperative lowered position,
- and a put-out table connected to said linkage assembly for receiving the compressed material as said ram pushes the compressed material onto said put-out table whereby said put-out table functions to eject the compressed scrap material as said supply table is raised to position other scrap material to be compressed onto said base.

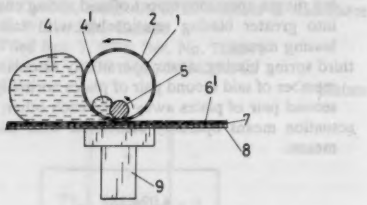
4,094,241

PERFORATED DOCTOR ROLL

Edgar Kössler, Schachterlweg 24/52, A-9020 Klagenfurt, Austria

Filed Aug. 23, 1976, Ser. No. 716,687
Claims priority, application Austria, Aug. 29, 1975, 6665/75
Int. Cl.[2] B41F *15/44*
U.S. Cl. 101—120 **2 Claims**

1. An apparatus for applying ink to a substrate comprising: bearing means disposed beneath said substrate; a stencil having openings in the desired pattern arranged in superimposed relationship to said substrate; a doctor roll contacting said stencil under a positive contact pressure; a first ink supply located in front of said doctor roll, said doctor roll applying ink from said first ink supply through the openings of said stencil; wherein: said doctor roll being defined as a rigid hollow tube having a plurality of perforations about its periphery, said perforations being adapted to reduce hydrodynamic pressure in said first ink supply, whereby part of the ink from said first ink supply enters the interior of said rigid hollow tube through said perforations to form a second inner ink supply;



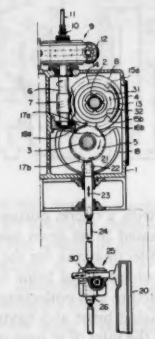
said doctor roll being further defined by a rod-shaped member disposed in said hollow tube, said rod-shaped member providing a second internal doctor roll for said second ink supply.

4,094,242

LIFTING DEVICES FOR FLAT SCREEN PRINTER

Shiro Ichinose, 11-8,4-Chome, Shinohara Kita-machi, Nada-ku; Kobe-shi, Hyogo-ken, Japan

Filed Jun. 14, 1976, Ser. No. 695,392
Int. Cl.[2] B41F *15/08, 15/44*
U.S. Cl. 101—123 **4 Claims**



1. An automatic screen printing machine comprising a transporting mechanism for supporting thereon a material to be printed and transporting it continuously or intermittently to a printing operation zone, a flat screen disposed in the printing operation zone above a running passage for the material to be printed, a squeegee member disposed above said screen to squeeze out a printing paste or ink onto the material to be printed through said screen, and a lifting device disposed in said operating zone for causing the material to be printed to come into contact with the screen during a printing step and of separating the material from the screen during a non-printing period by moving vertically at least one of said transporting mechanism and said squeegee member and screen relative to each other by means of a lifting member; said lifting device comprising a lifting cam mechanism and a gear mechanism for driving intermittently said lifting cam mechanism and restraining intermittently said lifting cam mechanism, said gear mechanism comprising a first partially toothed wheel including a toothed large diameter circumferential portion and a non-toothed small diameter circumferential portion, said partially toothed wheel being continuously driven and rotated by driving means connected therewith and a second partially toothed wheel including at least one toothed circumferential portion and at least one projected portion having a concave face capable of engaging the non-toothed smooth circumferential portion of the first partially toothed wheel, said first and second partially toothed wheels disposed adjacent to and in operable

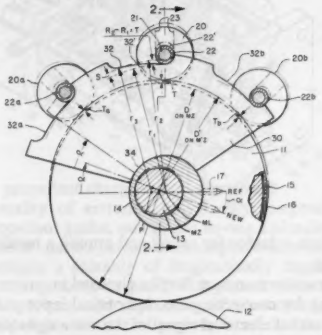
contact with each other such that the first and second partially toothed wheels are intermittently engaged with each other and are intermittently restrained by each other whereby engagement of the teeth of said first partially toothed wheel with the teeth of said second partially toothed wheel, drives and causes the second partially toothed wheel to rotate, and engagement of the projected portion of said second partially toothed wheel with the non-toothed smooth circumferential portion of said first partially toothed wheel, restrains the rotation of the second partially toothed wheel; said lifting cam mechanism including a cam and said second partially toothed wheel wherein said cam is fixed to said second partially toothed wheel to rotate together and said cam mechanism is operably connected to said lifting member whereby the rotation of said second partially toothed wheel and said cam causes the lifting member to be lifted or lowered and to be held at an elevated position or a lowered position by restraint of the rotation of said second partially toothed wheel.

4,094,243

DEVICE FOR ADJUSTING FORM ROLLERS PROVIDING AUTOMATIC COMPENSATION FOR CHANGE IN PACKING THICKNESS

Rolf Braun, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG., Germany

Filed Jun. 20, 1977, Ser. No. 808,083
Claims priority, application Germany, Jun. 23, 1976, 2627963
Int. Cl.[2] B41L *27/36*
U.S. Cl. 101—349 **7 Claims**



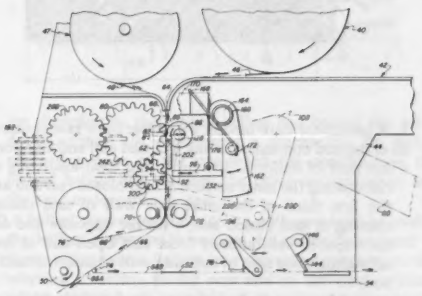
1. In a printing press, the combination comprising a frame, a plate cylinder journaled in the frame and mounting a printing plate with a layer of packing interposed between the cylinder and the plate, a cooperating cylinder journaled in the frame running in engagement with the plate, the plate cylinder having at least one form roller having a bearing at a peripheral position substantially spaced from said cooperating cylinder, an eccentric bushing interposed between the plate cylinder and the frame rockable from a reference position t an adjusted position for increasing the spacing between the axes of the plate cylinder and its cooperating cylinder as necessary to accommodate an increase in the thickness of the packing, a cam sector rockably mounted at the end of the plate cylinder having a spirally curved segment for radially supporting the form roller bearing with respect to the plate and mounted for rocking movement for camming the roller relatively away from the axis of the plate cylinder, the cam sector being rotatively coupled to the eccentric bushing for rocking movement in unison therewith accompanied by relative wiping action between the curved segment and the roller bearing, the spiral slope of the curved segment being such that the degree of rocking of the eccentric bushing necessary to accommodate a predetermined increase in packing thickness causes a total outward throw at the form roller equal to the movement of the plate cylinder axis toward the form roller plus an amount equal to the added thickness of the packing.

4,094,244

HAND-HELD BAR CODE LABEL MARKING DEVICE

Richard A. Edwards, Alameda, and Cecil G. Olson, Castro Valley, both of Calif., assignors to Dymo Industries, Inc., San Francisco, Calif.

Filed Dec. 22, 1976, Ser. No. 753,422
Int. Cl.[2] B41J *1/44*
U.S. Cl. 101—66 **23 Claims**



1. A label marking device for printing selected bar code and alpha-numeric character information upon a label, said device comprising:

a frame;

a printing station on the frame;

a supply of labels;

a printing medium;

a plurality of scribe elements mounted on the frame for location of selected scribe elements, corresponding to selected bar code character information, at a first location at the printing station;

a plurality of print elements mounted on the frame for location of selected print elements, corresponding to selected alpha-numeric character information, at a second location at the printing station, the second location being adjacent to and spaced from the first location;

pressure means mounted on the frame for placement at the first location;

impact means mounted on the frame for placement at the second location; and

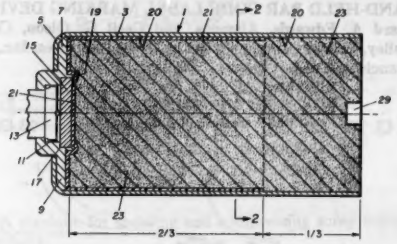
actuating means on the frame capable of actuation through a cycle of operation for moving a label, from the supply, together with a portion of the printing medium juxtaposed with the label, between the pressure means and the selected scribe elements at the first location while urging the pressure means to press and continue to urge the juxtaposed label and printing medium against the scribe elements while the scribe elements remain stationary so as to scribe information on the label in the form of a bar code having code bars running parallel to the direction of movement of the label as a result of such movement of the label relative to the scribe elements during a first portion of said cycle, and actuating the impact means to impact the juxtaposed label and printing medium momentarily with the selected print elements at the second location so as to print information on the same label corresponding to said selected alpha-numeric characters during a second portion of said cycle.

4,094,245

PARACHUTE FLARE HAVING A VARIABLE BURN RATE

Joseph R. Matura, Ironia, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 2, 1977, Ser. No. 793,007
Int. Cl.[2] F42B *4/28*
U.S. Cl. 102—35 8 Claims



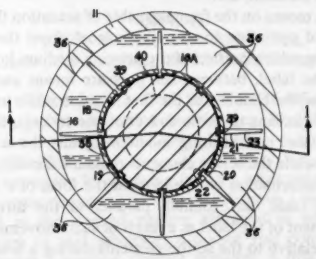
1. A parachute flare having a variable burn rate comprising:
an elongated container having a closed end and an open end;
a thin liner of uniform burn-inhibiting, heat-insulating material coating the inner surface of said closed end and at least the first third of the inner side wall of said container, starting at said closed end; with the opposite end of said liner spaced substantially from said open end to leave a substantial bare area of said side wall adjacent to said open end;
a mass of substantially-iniform, combustible, illuminating material completely filling said container and in contact with said liner and said bare area; and
means for igniting said illuminating material at said open end;
whereby said flare can be transported to a given altitude over an area to be illuminated, where it is ignited and burns at a given intensity for a first predetermined time, during a first portion of its fall, and then burns at a substantially lower intensity for a second predetermined time, during a second portion of its fall.

4,094,246

FLUID STABILIZING INSERT FOR PROJECTILES

Bruce W. Travor, Holland, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 8, 1975, Ser. No. 638,724
Int. Cl.[2] F42B *13/14*
U.S. Cl. 102—66 3 Claims



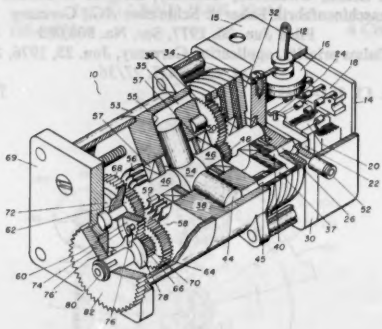
1. In a spin stabilized projectile having a main projectile body and a forwarded nose member secured thereto, said body containing a burster tube and a controlled liquid arrangement for minimizing rotational spin loss of the projectile,
a cellular structure within said body and extending radially outward of said burster tube, said cellular structure having a plurality of longitudinally extending contoured ribs defining elongated chambers containing portions of said liquid, said cellular structure including a substantially cylindrical slotted tube surrounding said burster tube, the sidewall of said slotted tube having a plurality of circumferentially spaced longitudinally extending slots, each of said ribs having a head portion, a blade portion and an intermediate reduced neck portion, each of said neck portions extending longitudinally within a corresponding one of said tube slots, each of said rib head portions having a width larger than that of its corresponding slot and each head portion extending inwardly adjacent to its corresponding slot.

4,094,247

SWITCH ACTUATOR

Albertus E. Schmidlin, Caldwell, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 23, 1977, Ser. No. 771,214
Int. Cl.[2] F42C *15/00*
U.S. Cl. 102—228 5 Claims



1. A switch actuator for safing and arming a missile:
a housing;
optical transducer means fixedly disposed in one end of said housing for converting a coded optical input pulse signal into a coded electrical signal of the same signature as said optical signal;
amplifier means electrically coupled to said optical transducer means for generating an amplified coded electrical output signal in response to said coded electrical signal;
solenoid means having a magnetically operated flapper valve member pivotally connected therewith, said solenoid means being electrically coupled to said amplifier means for converting said amplified coded electrical signal into a reciprocating mechanical motion of said flapper valve member;
pneumatic supply cover means proximately positioned adjacent to said solenoid means, said pneumatic supply cover means having two pneumatic passageways transversely diametrically disposed therethrough, for alternatively generating, in cooperation with said solenoid means, a coded pneumatic output pulse from each of said pneumatic passageways;
rotating valve plate means operatively disposed adjacent said pneumatic supply cover means, for mechanically decoding each of said coded pneumatic output pulses into sequential pressure pulses;
pneumatic piston-cam type prime mover means having a pneumatic input pneumatically connected to the output of said rotating valve plate means, said prime mover means being gear-connected to said rotating valve plate means to

rotate said valve plate means at ½ of the prime mover means speed;

geneva movement means having a driver gear assembly and a follower assembly, said geneva movement means being gear connected to said prime mover means, said geneva driver gear assembly rotating at ½ the prime mover means speed, said geneva movement means requiring full 270° rotation of said driver gear assembly prior to said switch actuator being placed in an intermediate arming position, and requiring two additional complete turns before said driver gear assembly causes said follower assembly to make a complete revolution which will then place said missile in an armed condition; and

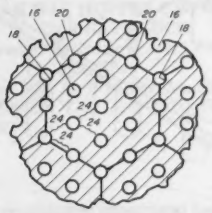
biasing means operatively disposed on said prime mover means intermediate said geneva movement means and said primer mover means for returning said switch actuator to a fail-safe position when said optical transducer means fails to receive a coded optical signal of a specific signature for a given duration.

4,094,248

HIGH PACKING DENSITY PROPELLANT GRAINS

Sidney S. Jacobson, Chester, N.J., assignor to The United States of America as represented by Secretary of the Army, Washington, D.C.

Filed Apr. 21, 1977, Ser. No. 789,598
Int. Cl.² F02K *9/02*
U.S. Cl. 102—100 **4 Claims**



1. A propellant charge which comprises:

a plurality of extruded polygonally longitudinal shaped propellant grains, said grains having a plurality of equally spaced internal perforations longitudinally disposed therethrough, a plurality of longitudinally disposed external vertex grooves in parallel alignment with said internal perforations, and a plurality of semi-circular longitudinally disposed external grooves located at the midpoint of each polygonal side, said semi-circular grooves being in parallel alignment with said internal perforations and said external vertex grooves, said plurality of internal perforations vertex grooves, and said semi-circular grooves each being separated by a web of equal thickness.

4,094,249

APPARATUS FOR LAYING TRACK

Josef Theurer, Vienna, and Manfred Brunninger, Linz, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 13, 1976, Ser. No. 749,885
Claims priority, application Austria, Feb. 2, 1976, 723/76
Int. Cl.² E01B *27/11, 29/06*
U.S. Cl. 104—6 **4 Claims**

1. An apparatus for laying track comprised of rails and ties on a ballast bed, comprising the combination of

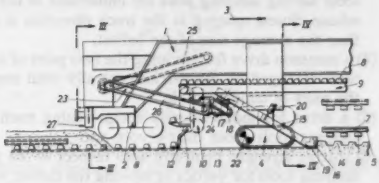
(a) an elongated bridge-like carrier frame having a rear end,

(b) a rear undercarriage for moving the carrier frame in a working direction on the track rails, the undercarriage supporting the carrier frame adjacent the rear end thereof,

(c) another undercarriage supporting the carrier frame adjacent the rear undercarriage and retractably arranged on the carrier frame for selective engagement with the ballast bed for moving the carrier frame in the working direction on the ballast bed in the absence of a track for the rear undercarriage,

(d) an endless scraper conveyor chain vertically adjustably mounted on the carrier frame and including a transversely extending stringer arranged for engagement with the ballast bed upon vertical adjustment of the conveyor chain for planing the ballast bed and conveying excess ballast from the planed ballast bed, the stringer of the conveyor chain being arranged in front of the other undercarriage,

(e) conveyor means mounted on the carrier frame and arranged to convey ties in a direction opposite to the working direction to the planed ballast bed behind the other undercarriage and comprising a mechanism for laying successive ones of the conveyed ties spacedly on the planed ballast bed between the other undercarriage and the rear undercarriage, and



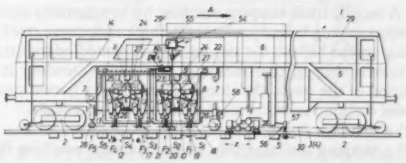
(f) a ballast conveyor moving in a path arranged to enable the ballast conveyor to receive the excess ballast and to convey the excess ballast in a direction opposite to the working direction to the rear end of the carrier frame where the ties have been laid on the planed ballast bed, a transversely extending portion of the path of the ballast conveyor intersecting the path of the conveyor means in the region of the mechanism.

4,094,250

MOBILE TRACK TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 22, 1976, Ser. No. 669,207
Claims priority, application Austria, Jun. 20, 1975, 4773/75
Int. Cl.² E01B *27/17*
U.S. Cl. 104—12 **12 Claims**



1. A mobile track tamping machine for substantially simultaneously tamping ballast underneath five successive track ties resting on the ballast, the ties having elongated edges extending transversely of the track and two ends extending in the direction of the track, the elongated edges of adjacent ones of the ties defining cribs therebetween, which comprises

(a) a machine frame; and

(b) two like tamping tool assembly units mounted on the machine frame for vertical movement, each tamping tool assembly unit being a structural unit including

(1) a carrier for the tamping tools mounted on the machine frame for vertical movement and adjustably spaced from each other in the direction of the track,

(2) no more than four tamping tools immersible in the ballast and arranged on the carrier in two like pairs of vibratory tamping tools spaced from each other in the

direction of the track, the spacing being such that each pair of tools is in vertical alignment with a respective one of two successive ones of the cribs whereby the tamping tools of each pair may be immersed in the respective crib upon vertical downward movement of the carrier,

(3) a pivot mounting each one of the tamping tools on the carrier for reciprocation of the tamping tools of each pair in opposite directions towards and away from a respective one of the elongated edges of an adjacent one of the ties, the pivots of each of the pairs of tamping tools being spaced from each other in the track direction less than one crib width, and the pairs of tamping tools having tamping jaws for immersion in the ballast whose closest spacing in the track direction is smaller than the average size of the ballast,

(4) a common drive for vibrating the two pairs of tamping tools arranged on the carrier centrally with respect to the pairs of tamping tools,

(5) a drive for independently reciprocating each of the tamping tools about their pivots, and

(6) a drive arranged centrally with respect to the pairs of tamping tools for vertically moving the carrier with the tamping tools;

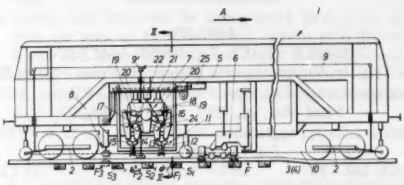
(c) the spacing of the tamping tool assembly unit carriers being such that the pairs of tamping tools may be immersed in four successive ones of the cribs upon the vertical movement of the carriers.

4,094,251

MOBILE TRACK TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Frank Plasser Bahnbaummaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 22, 1976, Ser. No. 669,208
Claims priority, application Austria, Jun. 20, 1975, 4774/75
Int. Cl.[2] E01B *27/17*
U.S. Cl. 104—12 **14 Claims**



1. A mobile track tamping machine for substantially simultaneously tamping ballast underneath three successive track ties resting on the ballast, the ties having elongated edges extending transversely of the track and two ends extending in the direction of the track, the elongated edges of adjacent ones of the ties defining cribs therebetween, which comprises

(1) a machine frame; and

(2) a tamping tool assembly mounted on the machine frame and including

(a) a carrier for the tamping tools mounted for vertical movement on the frame,

(b) no more than four tamping tools immersible in the ballast and arranged on the carrier in two pairs of vibratory tamping tools spaced from each other in the direction of the track, the spacing being such that each pair of tools is in vertical alignment with a respective one of two successive ones of the cribs whereby the tamping tools of each pair may be immersed in the respective crib upon vertical downward movement of the carrier,

(c) a pivot mounting each one of the tamping tools on the carrier for reciprocation of the tamping tools of each pair in opposite directions towards and away from a respective one of the elongated edges of an adjacent one of the ties, the pivots of each of the pairs of tamping tools being spaced from each other in the track direction less than one crib width, and the pairs of tamping tools having tamping jaws for immersion in the ballast whose closest spacing in the track direction is smaller than the average size of the ballast,

(d) a common drive for vibrating the two pairs of tamping tools arranged on the carrier centrally with respect to the pairs of tamping tools,

(e) a drive for independently reciprocating each of the tamping tools about their pivots, and

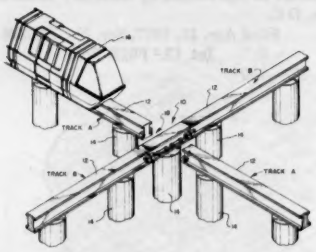
(f) a drive arranged centrally with respect to the pairs of tamping tools for vertically moving the carrier with the tamping tools.

4,094,252

SELF-CONTROLLED ON-GRADE MONORAIL TRACK SWITCH AND METHOD

Hendrik Pater, 4154 Parkview Dr., Salt Lake City, Utah 84117; G. Earl Torgersen, Salt Lake City, and Fritz R. Brunner, Murray, both of Utah, assignors to Hendrik Pater, Salt Lake City, Utah

Filed Apr. 22, 1976, Ser. No. 679,266
Int. Cl.[2] E01B *7/00*
U.S. Cl. 104—130 **20 Claims**



18. An automated mass transit switching system comprising in combination:

a plurality of converging tracks;

at least one vehicle adapted to travel on said tracks, said vehicle causing a control signal to be transmitted along the tracks ahead of it so as to sense any open portion of track ahead of it, said vehicle automatically stopping in response to an open portion of track sensed; and

a junction switch disposed between the ends of said converging tracks, said junction switch comprising:

means for sensing the approach of any oncoming vehicle by detecting the electric signal originating with the vehicle;

means for moving the switch into alignment with the path of the nearest oncoming vehicle in response to the vehicle originated signals;

means for disabling said moving means when the track is in alignment with the path of the nearest oncoming vehicle until said nearest oncoming vehicle has passed the switch; and

means for securing the switch in alignment position.

4,094,253

RAILWAY TRUCK FLOATING PEDESTAL WEAR LINER

Paul E. Gage, Wyomissing, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Jul. 26, 1976, Ser. No. 708,661
Int. Cl.[2] B61F *5/30, 5/50, 17/36;* F16C *33/20*
U.S. Cl. 105—225 **4 Claims**

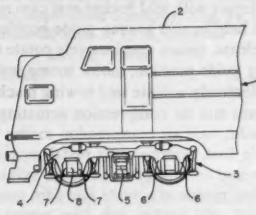
1. In a pedestal truck for railroad locomotives including:

a pair of spaced-apart, vertically-disposed pedestal legs that define a jaw open at its lower end;

a journal box mounted within the jaw in vertical sliding relationship to the pedestal legs;

a pedestal tie bar extending between the ends of the pedestal legs closing the lower end of the jaw;

generally channel-shaped pedestal liners made from tough, wear-resistant plastic mounted on each of the pedestal legs with the bight of the channels facing the journal box and



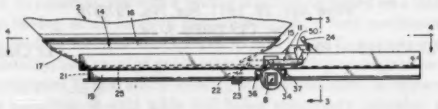
interposed as bearing surfaces between the journal box and the pedestal legs and with the sides of the channels extending over a portion of the side faces of the pedestal legs; the improvement comprising mounting the pedestal liners in sliding frictional engagement with the journal box on one side and the pedestal legs on the other side.

4,094,254

LOCK FOR RAILWAY HOPPER CAR GATE RAILWAY CAR GATE LOCK

Clarence J. Koranda, 5042 Lawn Ave., Western Springs, Ill. 60558

Filed Dec. 27, 1976, Ser. No. 754,835
Int. Cl.[2] B61D *7/20, 7/26, 49/00;* **F05B** *65/18*
U.S. Cl. 105—282 P **7 Claims**



1. In a lock for a railway hopper car gate in which a hopper outlet chute defines a discharge opening with a sliding plate gate operating in the opening and an undercarriage structure having a pair of spaced side frame means supporting the gate for sliding movement relative the opening, the improved gate lock comprising an elongated lock shaft extending between and projecting through guide slots formed in both side frame means with one of the frame means also being formed with a locking opening, handle support means associated with each side frame means, a handle fixed to each of the shaft ends with each handle having a return leg supported by its associated handle support means for transverse and pivoting movement relative each frame means whereby an initial pivoting movement of the lock shaft about both return legs and a subsequent transverse movement of the lock shaft by operation of either handle effects an engagement of one of the return legs into the locking opening to thereby lock the gate.

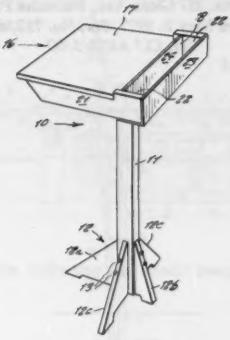
4,094,255

ARTIST'S PALETTE, PAINT AND ACCESSORY STAND

Nathan J. Zaccaria, 257 Glen Ave., Palisades Park, N.J. 07650

Filed Feb. 7, 1977, Ser. No. 766,232
Int. Cl.[2] A47B *85/00*
U.S. Cl. 108—25 **9 Claims**

1. An artist's palette, paint and accessory stand, comprising in combination an upright pedestal post, feet means secured around a lower end of said post, and a platform unit including a horizontal table top, a box-like tray adjacent one side edge of said table top, and a cross-beam attached to the underneath side of the table top and extending from said tray to proximate



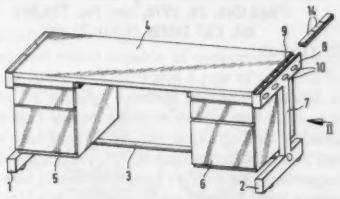
the opposing side-edge of the table top, said cross-beam being attached to an upper end of said post.

4,094,256

WORK TABLE HAVING LINES EMBODIED THEREIN

Manfred Hölper; Günter Schertel, and Egon Kösters, all of Pohlheim, Germany, assignors to VOKO Franz Vogt & Co., Pohlheim, Germany

Filed Jun. 7, 1976, Ser. No. 693,173
Claims priority, application Germany, Jun. 7, 1975, 2525498
Int. Cl.[2] A47B *35/00, 77/08*
U.S. Cl. 108—50 **10 Claims**



1. A work table having a work surface thereon, comprising:

a pair of horizontally spaced and hollow side supports each having adjacent their upper ends a cross piece, said cross pieces being parallel with each other and supporting said work surface adjacent the lateral edges thereof;

a channel in each of said cross pieces which extend parallel with said lateral edges of said work surface, at least one of said channels having at least one opening therein for guiding electrical wires therethrough from the interior of said cross piece to the exterior thereof;

a cavity in each of said side supports for housing said electrical wires, said cavity extending along the height thereof and communicating with at least one of said channels in said cross pieces; and

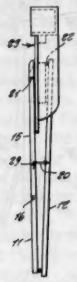
electrical socket means connected in electrical circuit with said electrical wires and mounted in said opening in at least one of said channels in at least one of said cross pieces.

4,094,257

FOLD UP ARTIST PALETTE, PAINT AND ACCESSORY STAND

Nathan J. Zaccaria, 257 Glenn Ave., Palisades Park, N.J. 07650

Filed May 2, 1977, Ser. No. 792,664
Int. Cl.[2] A47B 3/00
U.S. Cl. 108—115 6 Claims



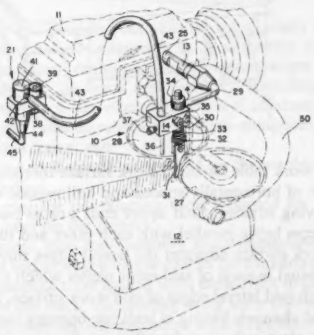
1. A fold up artist palette, paint and accessory stand comprising, in combination: a base having a flat lower surface and front and rear sides; a single leg pivotally connected to said front side of said base; a brace pivotally connected to said rear side of said base; coupling means for detachably coupling an upper end of said brace to an intermediate portion of said leg, said coupling means comprising a bifurcated member having a support surface between the bifurcation; and a stud member fitting into said bifurcated member and having a cooperating surface engaging said support surface, said bifurcated member being positioned on one of said brace or leg, and said stud member being positioned on the other, whereby secure engagement is maintained in an assembled condition while permitting easy separation thereof for disassembly; and a stand top pivotally connected to the upper end of said leg and in assembled condition lying parallel to said lower base surface.

4,094,258

FUR GUIDE FOR A FUR-SEWING MACHINE

Caesar Bonis, Barkers Point Rd., Sands Point, N.Y. 11024

Filed Oct. 29, 1976, Ser. No. 736,891
Int. Cl.[2] D05B 23/00, 35/00
U.S. Cl. 112—20 11 Claims



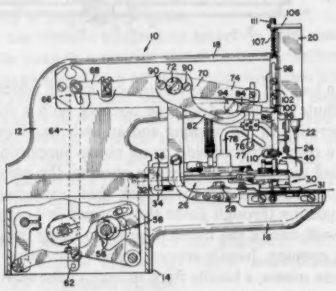
1. A sewing guidance system installable in the conventional cover of the head of a fur-sewing machine, said sewing guidance means comprising a fur-sewing machine head, a head cover, a rocker arm, said rocker arm rotatably mounted in said head cover, said rocker arm adapted to rotate to a sewing guide position and to rotate away from said sewing guide position, said rocker arm including spring means, said spring means normally biasing said rocker arm away from said sewing guide position, means to hold said rocker arm in said sewing guide position, means on said rocker arm to mount a fur guide and a blower nozzle, air compression means, means connecting said air compression means with said nozzle, means to actuate said air compression means, cam means on said rocker arm adapted to selectively interact to release said rocker arm from said sewing guide position, cam means in said head adapted to selectively interact with said rocker arm cam means when said rocker arm is held in said sewing guide position to effect said rocker arm release, means to selectively rotate said rocker arm to said sewing guide position, motor means, said motor means adapted to selectively actuate said sewing machine, said motor actuating means and air compression actuating means being a single foot pedal, said air compression means being individually actuatable first, another foot pedal means to rotate said rocker arm to said sewing guide position, said other foot pedal means including means to actuate said cam means in said head to interact with said rocker arm cam means to release said rocker arm from said sewing guide position, and said means to hold said rocker arm in sewing guide position being two-part interlockable means, one part of said interlockable means being on said rocker arm and the other part of said interlockable means being in said head cover, said two-part interlockable means including a detent and a grasp means.

4,094,259

BUTTON ORIENTATING LIFTING MECHANISM

Roy W. Fletcher, Riverdale; Robert W. Volkmann, Arlington Heights, and Anthony D. Forte, Chicago, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Apr. 29, 1977, Ser. No. 792,376
Int. Cl.[2] D05B 3/14
U.S. Cl. 112—110 12 Claims



1. A cyclically operated sewing machine having a work support means, a clamp means mounted for movement toward or away from said work support means, lever means operable in timed relation to the sewing cycle to move said clamp means away from said support means, means secured to said clamp means for delivering articles to and removing them from the sewing station including orientating means vertically movable with respect to said delivery and removal means wherein the improvement comprises:

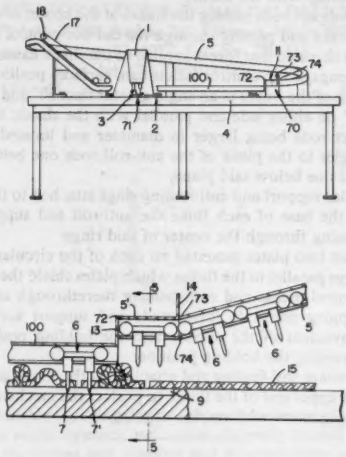
member means connectable to said orientating means and carried by said sewing machine for vertical sliding movement relative thereto; and

actuator means secured to said lever means and angularly responsive to movement thereof and operative to effect movement of said member means for effecting placement of said orientating means in timed relation to the sewing cycle.

4,094,260
METHOD AND APPARATUS FOR AUTOMATIC SEWING

Johann Otto Kleinschmidt, Karlsruhe, and Wolfgang Niem, Leonberg, both of Germany, assignors to Union Special G.m.b.H., Stuttgart, Germany

Filed Aug. 12, 1976, Ser. No. 713,949
Claims priority, application Germany, Aug. 14, 1975, 2536260; Jun. 5, 1976, 2625503; Jun. 5, 1976, 2625504
Int. Cl.[2] D05B *27/04*
U.S. Cl. 112—121.15 35 Claims



1. In combination with a sewing machine mounted on a table top having stitch forming instrumentalities, a feed mechanism for feeding material workpieces to said stitch forming instrumentality, and an edge guide means for guiding an edge of said workpieces to said stitch forming instrumentalities, an apparatus mounted on said table top being selectively operable to continuously feed workpieces to said instrumentalities, comprising:

guide rail means, a portion of which passes through said stitch forming instrumentalities;

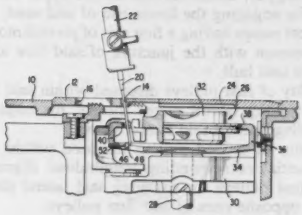
means carried by and guided through said stitch forming instrumentalities by said guide rail means and adapted to secure a plurality of workpieces together so that the movement imparted to said workpieces by said feed mechanism means continuously draws the next succeeding workpiece into the stitch forming instrumentalities to be sewn.

4,094,261
ADJUSTABLE NEEDLE GUARD

Stanley J. Ketterer, Jamesburg, and William J. Edwards, Cranbury, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Mar. 22, 1977, Ser. No. 779,957
Int. Cl.[2] D05B *55/06*
U.S. Cl. 112—228 4 Claims

1. A rotary loop taker for a sewing machine having a reciprocatory needle operating in a path for cooperating with said loop taker, said loop taker including a cup-shaped body formed by a bottom wall, a vertical side wall extending from said side wall, a loop seizing beak formed in said annular wall, a resilient rib member formed in said bottom wall, said rib member being spaced from said vertical side wall and disposed at a location substantially beneath said loop seizing beak, and means for deflecting said rib member away from said vertical side wall for adjusting the position of said rib member relative to the operating path of said needle and causing the rib member to be

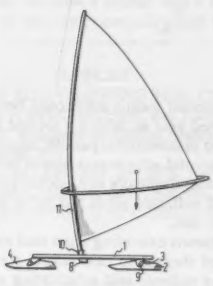


in a position for deflecting the needle away from said loop seizing beak.

4,094,262
ICECRAFT

Tilo Riedel, Wielandstrasse 6, D-8051 Eching, Germany

Filed Mar. 25, 1977, Ser. No. 781,446
Claims priority, application Germany, Mar. 26, 1976, 2612984
Int. Cl.[2] B63B *35/00*
U.S. Cl. 114—43 10 Claims



1. An icecraft comprising:

a rigid support board capable of supporting a person and having an outer periphery and a pair of opposite faces;

a plurality of runners directed generally parallel to one another and spaced apart on one of said faces in such a manner that said board can stand on said runners, said board being displaceable in a normal direction of travel on ice via said runners and said runners being arranged with two of said runners spaced transversely apart perpendicular to said direction and one of said runners spaced in said direction from said two runners;

means including a pivot connecting said one runner to said board for pivoting relative to said board about an axis generally perpendicular to said faces and caster-fashion generally ahead of said one runner in said direction;

an articulated sail-surfing mast projecting from the other of said faces; and

a sail secured to said mast and constituting therewith a standard sail-surfing rig.

4,094,263
HEEL COMPENSATION SYSTEM

Paul M. Marcil, 12117 Phillips Ave., Lynwood, Calif. 90262

Filed Jul. 19, 1976, Ser. No. 698,040
Int. Cl.[2] B63B *15/00*
U.S. Cl. 114—91 2 Claims

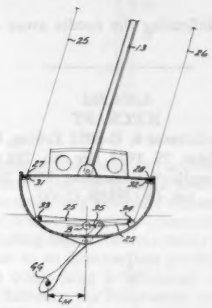
1. In a sailboat assembly including a hull, a mast disposed from said hull, a plurality of fore and aft stays and lateral stays

disposed between said mast and said hull for providing support to said mast and a ballasted keel disposed on the underside of said hull, the improvement comprising:

pivotal support means formed on the upper surface of said hull for engaging the lower end of said mast, said pivotal support means having a first axis of pivotal motion aligned in common with the juncture of said fore and aft stays within said hull;

a plurality of first pulleys disposed within said hull respectively along lateral edges thereof for engaging corresponding ones of said lateral stays;

a plurality of second pulleys disposed within said hull in substantial corresponding longitudinal alignment below said first pulleys for engaging said lateral stays directed from opposite ones of said first pulleys;



pivotal attachment means interposed between said hull and said ballasted keel including a second axis of pivotal motion aligned in substantial parallel alignment with said first axis, said pivotal attachment means including a pivot rod extending longitudinally in a pocket formed on the underside of said hull, said pivot rod being secured to said keel in rotation; and,

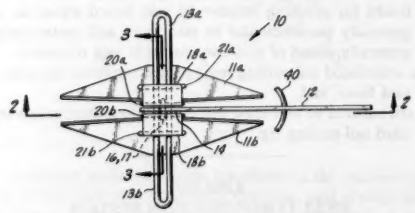
articulating means extending from said keel into said hull to be attached thereat to said lateral stays extending from said second pulleys, said articulating means including an arm secured to said pivot rod in the interior of said hull to extend radially therefrom, whereby lateral articulation of said mast is accompanied by an opposite articulation of said keel.

4,094,264

QUICK-RELEASE, SURE-SET ANTI-FOULING ANCHOR

Richard W. Nickerson, P. O. Box 294, and Thomas R. Nickerson, P. O. Box 654, both of Frazier Park, Calif. 93225

Filed Jul. 28, 1977, Ser. No. 820,044
Int. Cl.[2] B63B *21/24*
U.S. Cl. 114—304 **2 Claims**



1. A quick-release marine anchor comprising:

an attachment means;

a shank with an enlarged end portion on the extremity thereof opposite the attachment means;

said end portion axially cut-out to form a control means the forming edges of the cut-out control means being cam-like;

two flukes shaped like truncated triangles, one located on each end of the shank with the bases thereof parallel to the control means of the shank;

two U-shaped anti-roll rods or stocks attached at right angles to the center of the flukes and joined within the control means of the shank so that vertical forces applied to the shank cause the rod farthest from the enlarged end of the shank to engage the cam surfaces of the control means positioning the base of the flukes in parallel relationship with the shank;

two support rods joining the flukes at the center of the bases thereof and passing through the cut-out control means of the shank so that forces applied to the shank cause the rods to engage the control means cam surfaces positioning the base of the flukes at an angle greater than 30° and less than 40° on either side and parallel with the shank, such support rods being larger in diameter and located at right angles to the plane of the anti-roll rods one being above and one below said plane;

circular support and anti-fouling rings attached to the center of the base of each fluke the anti-roll and support rods passing through the center of said rings;

at least two plates mounted on each of the circular support rings parallel to the flukes which plates shield the cam-like control means and rods passing therethrough and act as tripping palms to form guide and support surfaces for movement of the anchor into the holding position and reversing the holding position;

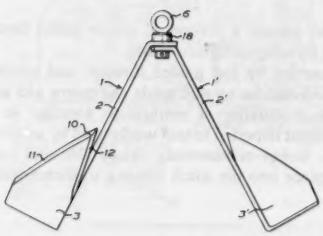
an arcuate anti-fouling rod attached to the shank just above the upper end of the flukes to protect the mechanism from engagement with marine vegetation.

4,094,265

DEVICE IN COLLAPSIBLE ANCHORS

Arvid Isaksson, N-Torngatan 17, Lidkoping, Sweden (S-531 00)

Filed Feb. 24, 1977, Ser. No. 771,517
Claims priority, application Sweden, Mar. 3, 1976, 7603000
Int. Cl.[2] B63B *21/44*
U.S. Cl. 114—307 **7 Claims**



1. A device in preferably collapsible anchors of the type having two flukes, said flukes being mounted on two shanks making an angle with each other, and each fluke, which has a sharp point, being fixed to the shank in such a manner that the major portion of the surface of said fluke is located at the side of and, in the operative position outside, each respective shank and spreads out in an inclined plane located transversely of the longitudinal direction of the shank, wherein there are provided, at the ends of the both shanks opposite said flukes, inclined portions with through-holes; wherein a bolt, suitably provided with a ring for an anchor line or chain, extends through the holes; wherein the bolt, which is intended to rest with an end abutment against one outer side of the mutually adjacent, inclined portions, is provided with a resilient means inserted under tension between an opposing abutment provided on the bolt and the other outer side of the mutually adjacent portions and holding said portions together in a paral-

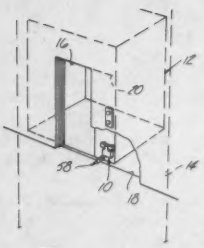
lel position; wherein an end portion extending radially from the bolt hole of one inclined portion is located at a greater distance from said bolt hole than an opposing abutment surface adjacent and connected to the second inclined portion, and wherein said opposing abutment surface is located and designed such that said extending end portion is movable out of and into locked position upon the shifting of said extending end portion of said one inclined portion in a direction away from said second inclined portion against the action of said resilient means.

4,094,266

ELEVATOR AUDIBLE SIGNALING DEVICE

Donald P. Artt, 37090 Jordan, Mt. Clemens, Mich. 48043

Filed Apr. 21, 1977, Ser. No. 789,613
Int. Cl.[2] B66B *3/00*
U.S. Cl. 116—64 **4 Claims**



1. An audible signaling device for an elevator car of the type having an access opening and a door slideably carried by said elevator car across said opening and movable from a closed position to an opened position, said audible signaling device comprising:

a housing means having a gong;

a striker carried by said housing means and operable upon engagement to strike said gong;

a magnetic responsive lever biased arm pivotally mounted in said housing for engaging said striker to cause said striker to strike said gong, said lever arm being movable when brought adjacent to a magnet;

said magnet comprising at least one permanent magnet mounted on a floor for actuating said lever arm to move toward engagement with said striker, means on said housing means coacting with the lever arm for maintaining said lever arm in a pivoted position while said lever arm is adjacent said magnet;

said housing means being mounted to said door of said elevator car such that, upon opening of said elevator car door, said lever is moved adjacent said magnet and activated to strike said striker, said magnet being so positioned that said lever remains in said pivoted position until said door commences to close.

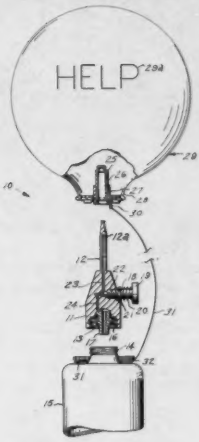
4,094,267

DISTRESS SIGNAL DEVICE

John Davis, Jr., Rte. 1, Box 172D, Eatonville, Wash. 98328

Filed Apr. 14, 1977, Ser. No. 787,441
Int. Cl.[2] G09F *9/00*
U.S. Cl. 116—124 B **1 Claim**

1. A distress signal device, comprising a colored balloon, a fitting secured to said balloon, with a cord secured fixedly thereto, a slidable sleeve secured within said fitting for the passage of helium gas for inflating said balloon, a cylinder removably received on a tank containing said helium gas, said cylinder including an extending stem having a passageway therein, which intersects with a side port, and said side port, when said stem is received within said slidable sleeve, aligns with a port of said slidable sleeve for the passage of said helium gas into said balloon and a screw shaft is threaded into said cylinder at right angles to said passageway, said screw shaft having a knob for controlling its lateral travel, which will cover and uncover a passageway leading to an offset and



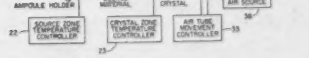
connecting passageway in the base of said cylinder, and said base of said cylinder includes a washer and a hollow stem for entering the neck of said tank containing said helium gas.

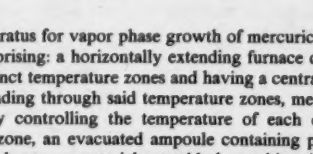
4,094,268

APPARATUS FOR GROWING HgI_2 CRYSTALS

Michael M. Schieber; Israel Beinglass, and Glora Dishon, all of Jerusalem, Israel, assignors to United States Department of Energy, Washington, D.C.

Division of Ser. No. 681,639, Apr. 29, 1976, Pat. No. 4,030,964. This application Mar. 30, 1977, Ser. No. 782,875
Int. Cl.[2] B01J *17/30*; C01G *13/04*
U.S. Cl. 118—49.1 **4 Claims**





1. An apparatus for vapor phase growth of mercuric iodide crystals comprising: a horizontally extending furnace divided into two distinct temperature zones and having a central heating box extending through said temperature zones, means for independently controlling the temperature of each of said temperature zone, an evacuated ampoule containing purified mercuric iodide source material rotatably located in said heating box of said furnace and positioned substantially equally in each of said temperature zones, means connected to said ampoule for rotating same, air supply means comprising a tube extending into said heating box along the length of said ampoule and having a plurality of axially spaced radially inwardly directed outlets for providing spaced axial airflows along said ampoule, air tube means extending into said heating box for providing a radial airflow about at least one end of said ampoule, means for varying air flowing through said air supply means to provide controllably variable airflows along the

length of said ampoule, and means for varying air flowing through said air tube means, and means for axially moving said air supply means in a direction axially away from said one end and said air tube means in an opposite directions axially away from said one end.

4,094,269

VAPOR DEPOSITION APPARATUS FOR COATING CONTINUOUSLY MOVING SUBSTRATES WITH LAYERS OF VOLATIZABLE SOLID SUBSTANCES

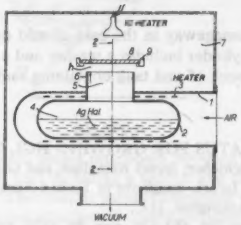
Yordan Petrov Malinovski; Stefan Todorov Bakardjiev, and Georgi Mirchev Martinov, all of Sofia, Bulgaria, assignors to Zlatop pri Ban, Sofia, Bulgaria

Division of Ser. No. 586,429, Jun. 12, 1975. This application Nov. 18, 1975, Ser. No. 632,916

Claims priority, application Bulgaria, Jun. 14, 1974, 26894

Int. Cl.[2] C23C *13/12*

U.S. Cl. 118—49.1 **5 Claims**



1. Apparatus for the continuous production of volatizable solid material-coated substrates which comprises wall means adapted for connection to a vacuum producing means and defining an essentially closed chamber in which the vacuum is produced by said vacuum producing means, crucible support means forming a part of said wall means and defining a recess therein, an elongated and closed crucible formed of material which is inert when heated to an elevated temperature mounted to the crucible support means outside of said chamber and substantially within said recess, the walls of the crucible support means being generally spaced from the walls of said crucible, said crucible having a rectangular neck portion extending upwardly through the crucible support means and into the chamber terminating in a restricted, rectangular outlet opening into the chamber for discharging vapor from said crucible therethrough, the interior of the crucible thereby communicating with the vacuum while the exterior of the crucible lies substantially completely outside said chamber and the transverse cross-sectional area of the elongated crucible being at least five times the cross-sectional area of the crucible outlet so that a direct collimated and rectangular beam of vapor of said solid material issues from the restricted outlet, radiant heating means located in the crucible support means and outside of the chamber for substantially uniformly heating the exterior of the crucible to vaporize solid material located therein and substrate support means located within the chamber for supporting a moving substrate during travel over said rectangular outlet of the crucible, the substrate supporting means being positioned so that the surface of the substrate passing over the outlet will be located not more than 10 mm from the outlet whereby a layer of the material completely free from impurities can be continuously deposited on the surface of the moving substrate.

4,094,270

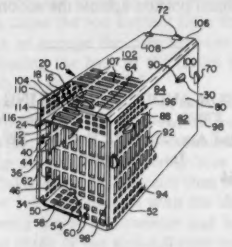
FISH EGG INCUBATING DEVICE

David W. Whitlock, Bartlesville, Okla., assignor to Federation of Fly Fishermen, El Segundo, Calif.

Filed Oct. 22, 1976, Ser. No. 735,001

Int. Cl.[2] A01K *61/00, 63/00*

U.S. Cl. 119—3 **4 Claims**



1. A device for incubating spherical fish eggs and for providing a protective rearing area for fry hatched from such eggs comprising:

a closed container having an upper egg incubating chamber, and a lower fry rearing chamber separated by a horizontal dividing wall,

said upper portion of said container being defined by said dividing wall and a top, side and end walls,

said dividing wall being provided with a plurality of apertures having a width slightly less than the diameter of said eggs but greater than the smallest dimension of the fry which hatch from said eggs,

said side, end and top walls having a plurality of apertures therein of a width less than the smallest dimension of the newly hatched fry to inhibit the entrance of predators and the escape of fry whereby escaping fry will tend to move when hatched through said dividing wall aperture into said lower fry rearing chamber,

said lower fry rearing chamber being defined by said dividing wall, side, bottom, and end walls,

said fry rearing chamber side, bottom and end walls having a plurality of apertures therein of sufficiently narrow width to inhibit the entrance of predators, but sufficiently wide to permit the escape of the fry after absorption of the egg sac and attainment of a free swimming state.

4,094,271

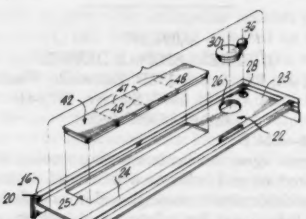
AQUARIUM BACKSTRIP

Anthony Louis, 437 Grinnell Dr., Burbank, Calif. 91501

Filed Nov. 1, 1976, Ser. No. 737,542

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—5 **5 Claims**



1. An aquarium top backstrip having, in combination:

a body adapted to be supported in a position overlying a portion of an aquarium;

means defining a plurality of openings extending through said body for receiving aquarium equipment; and

a plurality of plastic covers for said openings sized and shaped to close the openings when installed on said body, said covers having plate-like top members at least as large as the openings to be closed thereby, and means on the undersides of the covers for fitting into the openings and holding the covers tightly but releasably in place on said body;

at least one of said covers including means extending across the cover and weakening the cover along at least one preselected break line, whereby the cover may be separated into at least two sections to produce a partial cover for the associated opening held in place in the opening by said means on the underside thereof, and a replaceable cover for the remainder of the opening, and said sections may be rearranged in the associated opening to expose and cover different portions of the opening.

4,094,272

EXTERNALLY IGNITED FOUR CYCLE INTERNAL COMBUSTION ENGINE

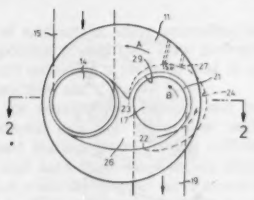
Michael G. May, Bel Air, CH 1180 Rolle, Switzerland

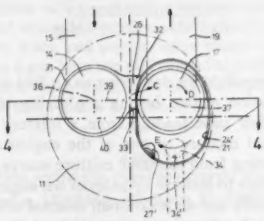
Continuation-in-part of Ser. No. 545,023, Jan. 29, 1975, Pat. No. 4,000,722. This application Nov. 10, 1975, Ser. No. 630,624

Claims priority, application Italy, Jan. 24, 1975, 19596 A/75

Int. Cl.² F02B *3/00*

U.S. Cl. 123—30 D **13 Claims**





1. An internal combustion engine, the combination comprising a cylinder head, an inlet valve and an outlet valve including respective face portions and respective stem portions having respective axes which terminate in spaced relation relative to the bore of a cylinder of the engine, a piston moving in reciprocation in said cylinder, a single chamber at least surrounding said face portion of said outlet valve and lying at least substantially within the extended geometrical surface defined by the path of said piston, and a passage leading from said face portion of said inlet valve to the said chamber surrounding the said outlet valve, so that in said chamber will be created near the end of the compression stroke a substantially single gaseous swirl flow, which is substantially parallel to the area of the piston top opposite said chamber, and further comprising a spark plug disposed in the side wall of said chamber and located in proximity to that side of the terminus of said passage which is nearest to the center of said swirl flow.

4,094,273

AIR-FUEL RATIO ADJUSTING SYSTEM

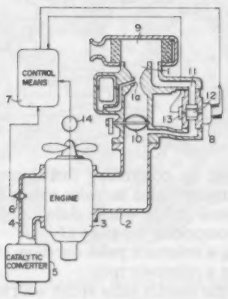
Tadashi Hattori, Okazaki, and Takamichi Nakase, Gamagori, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 24, 1976, Ser. No. 699,606

Claims priority, application Japan, Jul. 14, 1975, 50-86565

Int. Cl.² F02B *3/00*; F02M *7/12, 23/04*

U.S. Cl. 123—32 EE **4 Claims**



1. An air-fuel ratio adjusting system for an internal combustion engine comprising:

a carburetor connected to an intake manifold of an internal combustion engine and including a main passage and a bypass passage for supplying an air-fuel mixture to said engine;

said main passage being provided with a main valve for controlling the amount of the air-fuel mixture to be supplied to said engine, and said bypass passage being provided with a bypass valve for adjusting the air-fuel ratio of said air-fuel mixture by controlling the amount of air flowing therethrough;

a pulse motor coupled to said bypass valve for driving the same;

air-fuel ratio sensing means mounted in an exhaust manifold of said engine for sensing the air-fuel ratio of the mixture supplied to said engine;

pulse generating means for generating a first and a second train of pulses, the frequency of said first train of pulses being higher than that of said second train of pulses;

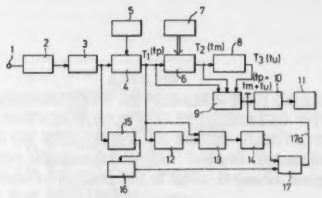
detecting means for detecting operational conditions of said engine; and

circuit means connected to said air-fuel ratio sensing means, pulse generating means and said detecting means for supplying said first train of pulses to said pulse motor both when said engine is operated under the no-load and when the air-fuel ratio detected by said air-fuel ratio sensing means exceeds a predetermined value so as to drive said pulse motor in a closing direction of said bypass valve at a speed determined by said first train of pulses, said circuit means supplying said second train of pulses to said pulse motor both when said engine is operated under the no-load and when the air-fuel ratio detected by said air-fuel ratio sensing means is below said predetermined value so as to drive said pulse motor in an opening direction of said bypass valve at a speed determined by said second train of pulses, whereby said bypass valve is driven in such a manner that the moving speed of said bypass valve in the opening direction is slower than that in the closing direction when said engine is under the no-load operation.

4,094,274
FUEL INJECTION CONTROL SYSTEM

Susumu Harada, Oobu, and Masakazu Ninomiya, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 4, 1976, Ser. No. 711,603
Claims priority, application Japan, Aug. 8, 1975, 50-96879
Int. Cl.[2] F02B *3/00*
U.S. Cl. 123—32 EL 9 Claims

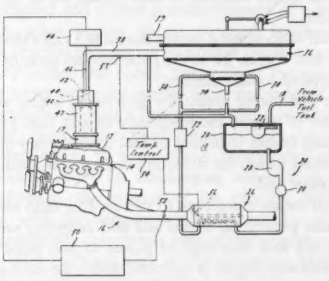


1. A method for controlling fuel injection in an internal combustion engine which includes means for generating fuel injection control pulses whose duration depends on engine parameters, comprising the steps of:
determining a reference pulse duration;
determining a reference rpm;
comparing the control pulse width with said reference pulse duration;
comparing the engine rpm, with said reference rpm;
interrupting fuel supply to the engine when the control pulse duration is less than said reference pulse duration and the engine rpm is greater than said reference rpm.

4,094,275
VAPORIZED LIQUID FUEL DELIVERY AND METERING SYSTEM

James E. Auiler, Ann Arbor; Douglas R. Hamburg, Birmingham; James E. Hyland, Trenton, and David F. Moyer, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1976, Ser. No. 660,281
Int. Cl.[2] F02M *31/08*
U.S. Cl. 123—34 A 12 Claims

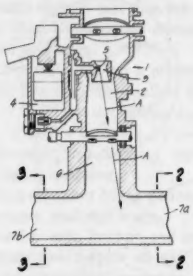


1. A fuel delivery and metering system for use in conjunction with an internal combustion engine having a source of fuel, which fuel is a liquid under standard temperature and pressure conditions, comprising in combination:
coarse liquid fuel delivery means communicating with the source of liquid fuel;
heating means in fluid communication with said delivery means operative to substantially completely vaporize liquid fuel delivered to said heating means by said delivery means;
vapor reservoir means spaced apart from, and in fluid communication with, said heating means operative to define a variable volume vapor storage space for receipt of said storage of vapor generated by said heating means, further operative to maintain the vapor stored therein at substantially atmospheric pressure;
means responsive to the volume of vapor within the vapor storage space operative to control said delivery means whereby the generation and supply of vaporized liquid fuel may be controlled to maintain a predetermined volume of vapor within the vapor storage space;
carburetor means in fluid communication with said vapor reservoir means operative to receive vaporized liquid fuel from said vapor storage and further operative to mix the fuel vapor with air to establish a combustible air/fuel mixture; and
means cooperative with said vapor reservoir means for maintaining the air/fuel ratio of the combustible mixture established by said carburetor means substantially constant for variations in the rate of establishment of the combustible mixture.

4,094,276
INTAKE MANIFOLD FOR INTERNAL COMBUSTION ENGINE

Akihisa Nakamura, Tokyo; Takashi Umemoto, Tokorozawa, and Sakuji Arai, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1976, Ser. No. 677,669
Claims priority, application Japan, Apr. 24, 1975, 50-49087
Int. Cl. F02b *75/18*
U.S. Cl. 123—52 M 6 Claims



1. An intake manifold for delivering an air-fuel mixture to an internal combustion engine having a plurality of cylinders, comprising: a first pipe leading from a mixture source for supplying air-fuel mixture to one of the engine cylinders, a second pipe leading from the same mixture source for supplying air-fuel mixture to another cylinder of the engine, the pipes having substantially the same constant internal cross sectional area, with smooth internal contours without discontinuities, the pipes each being non-circular in cross section, one of the pipes having an asymmetrical internal sectional contour in which the lower portion thereof is smaller than the upper portion thereof, the other pipe having an asymmetrical internal sectional contour in which the lower portion thereof is larger than the upper portion thereof.

4,094,277
INTAKE VALVE MECHANISM FOR PREVENTING BACK FLOW OF EXHAUST GAS

Kenji Goto, and Daisaku Sawada, both of Susono, Japan, assignors to Tokyo Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

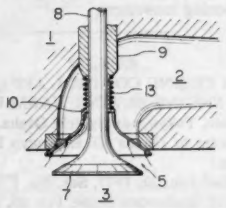
Filed Jun. 9, 1976, Ser. No. 694,445
Claims priority, application Japan, Jun. 24, 1975, 50-076441
Int. Cl.[2] F01L *1/28*
U.S. Cl. 123—52 MF 6 Claims

1. An intake valve mechanism for preventing the back-flow of gases from a combustion chamber of an internal combustion

engine out of an intake port of the chamber, said intake valve mechanism comprising:

(a) poppet valve means for alternately opening and blocking the intake port, said poppet valve means including an intake valve having a stem and further having a disc portion mounted on one end of said stem, said poppet valve means further including a valve guide for supporting said stem to allow said disc portion to selectively open and block said intake port of the engine;

(b) back-flow valve means positioned between said poppet valve means and said intake port for blocking said intake port in response to pressure in the combustion chamber, said back-flow valve means including a back-flow prevention valve having a hollow base and further having an expanded portion mounted on one end of said base, said hollow base being mounted concentric to said stem to allow said expanded portion to slide back and forth between said intake port and said disc portion, said disc



portion of said intake valve extending parallel said expanded portion of said back-flow prevention valve, said intake port including a recessed seat to receive said expanded portion; and

(c) means for continuously biasing said back-flow valve means toward said disc portion of said poppet valve means, said biasing means having sufficient strength to prevent said back-flow valve means from blocking said intake port when said poppet valve means is open until the pressure in the combustion chamber reaches a predetermined value, said biasing means including a spring positioned concentric to said hollow base of said back-flow prevention valve, said spring being proportioned for biasing said expanded portion substantially against said disc portion when said poppet valve means is closed, and for leaving a gap between said expanded portion and said disc portion under conditions of back-flow pressure when said poppet valve means is open.

4,094,278

TWO-STROKE COMBUSTION ENGINES

Walter Franke, Hittfelder Kirchweg 22, 2105 Seevetal 3, Germany

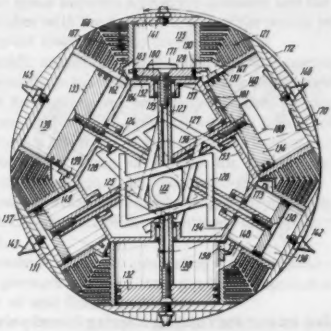
Division of Ser. No. 443,922, Feb. 19, 1974, Pat. No. 3,981,280. This application Jan. 13, 1976, Ser. No. 648,652

Claims priority, application Germany, Feb. 19, 1973, 2308127

Int. Cl.² F02B *75/20, 57/00*

U.S. Cl. 123—59 EC **7 Claims**

1. A two-stroke internal combustion engine comprising: working cylinder means; auxiliary cylinder means; working piston means reciprocally operable within said working cylinder means; auxiliary piston means reciprocally operable within said auxiliary cylinder means; working chamber means defined by said working cylinder means on one side of said working piston means; auxiliary working chamber means defined by said auxiliary cylinder means on one side of said auxiliary piston means; ignition means provided in both said working chamber means and said auxiliary working chamber means; first inlet port means and first outlet port means in both said working cylinder means and said auxiliary cylinder means, said first inlet and first outlet port means for each being controlled, respectively, by movement of said working piston means and said auxiliary piston means; first channel means connecting said first outlet port means of said working cylinder means with said first inlet port means of said auxiliary cylinder means to effect transfer of all of the exhaust gasses in said working chamber means into said auxiliary working chamber means at the end of a power stroke of said working piston means; said auxiliary piston means operating to effect compression within



said auxiliary working chamber means of the total exhaust gas quantity thus transferred from said working chamber means; said ignition means operating to effect ignition of said compressed exhaust gasses within said auxiliary working chamber means thereby to effect a power stroke of said auxiliary piston means as a result of said ignition of said exhaust gasses.

4,094,279

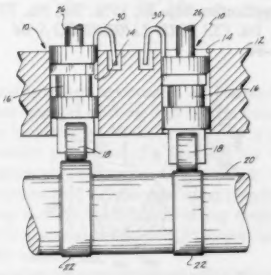
DUCTILE IRON ROLLER TAPPET BODY AND METHOD FOR MAKING SAME

Kenneth E. Kueny, North Muskegon, Mich., assignor to Johnson Products Div. of Sealed Power Corporation, Muskegon, Mich.

Filed May 7, 1976, Ser. No. 684,250

Int. Cl.² F01L *1/14*

U.S. Cl. 123—90.51 **6 Claims**



1. In a roller tappet of the type including a central valve lifter body having a bifurcated end supporting a roller, the body being adapted for reciprocating movement within a bore formed in a cast iron engine block, wherein the improvement comprises:

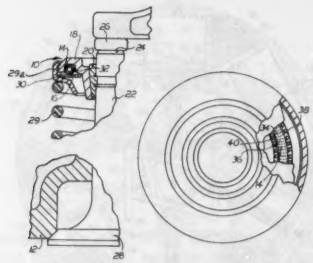
said body being formed from nodular iron.

4,094,280

VALVE ROTATING DEVICE

Stanley H. Updike, Painesville, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 6, 1976, Ser. No. 703,071
Int. Cl.[2] F01L *1/32*; F16K *29/00*
U.S. Cl. 123—90.3 8 Claims



5. A valve rotator for rotating a spring biased valve about the axis of the stem of the valve in an internal combustion engine, said valve rotator comprising:

(a) a body to be located coaxial with the valve stem, attached to and rotatable with the valve stem, said body having an annular groove therein;

(b) a valve spring retainer coaxial with and adjacent said body and adapted for contact with the valve biasing spring;

(c) a garter spring disposed in said annular groove, said garter spring comprising a series of coils;

(d) a Belleville washer located between said garter spring and said valve spring retainer and which applies a force on the coils tending to tilt the coils when said body and said valve spring retainer move axially toward each other;

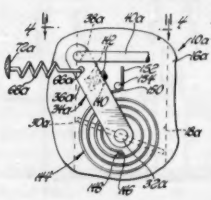
(e) means located internally of the coils of said garter spring and extending coextensively therewith, said means engaging said coils and increasing the axial load capacity of said garter spring and clamping the coils of the garter spring between said Belleville washer and said body to minimize distortion of said coils as well as to minimize oscillation of the garter spring coils upon axial loading of the garter spring due to said body and said valve spring retainer moving axially toward each other.

4,094,281

RESILIENT THROTTLE STOP MEANS

Milton J. Kittler, 48 Casablanca Est's., Scottsdale, Ariz. 85253

Division of Ser. No. 522,236, Nov. 8, 1974, Pat. No. 4,016,842.
This application Sep. 20, 1976, Ser. No. 724,556
Int. Cl.[2] F02D *11/02*; G05G *5/04*
U.S. Cl. 123—98 7 Claims



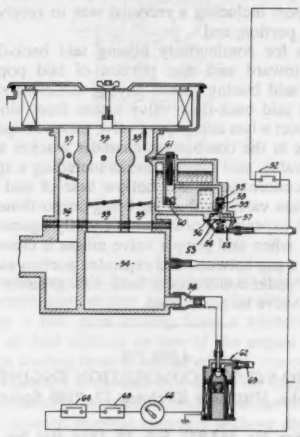
1. Resilient throttle stop apparatus for use in combination with a combustion engine wherein said engine comprises an intake structure, induction passage means, formed in said intake structure, and throttle valve means for controlling flow through said induction passage means, said throttle stop apparatus comprising first resilient means, second resilient means, said induction passage means being fixedly secured to and supported by said engine, said first resilient means being operatively connected to said throttle valve means as to apply thereto a first resilient force for urging said throttle valve means in a closing direction, and said second resilient means being effective regardless of whether or not said engine is operating to at times exhibit an added resilient resistance force resisting further opening movement of said throttle valve means by associated throttle lever means after said throttle valve means has been opened to a preselected degree, said second resilient means said induction passage means said throttle valve means and said connecting means all being commonly supported by said engine, said second resilient means comprising torsion spring means preloaded as to cause said added resilient resistance force to be of a preselected minimum value upon initiation of said further opening movement, wherein said spring means comprises a generally angularly deflectable end, and wherein said throttle lever means operatively engages and angularly deflects said deflectable end upon said initiation of said further opening movement.

4,094,282

IGNITION TIMING CONTROL APPARATUS FOR ENGINE DURING WARM-UP

Teruyuki Nakano, Tokyo, and Syoichi Otaka, Miyoshi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1977, Ser. No. 771,107
Claims priority, application Japan, Feb. 25, 1976, 51-20431[U]
Int. Cl.[2] F02P *5/12*
U.S. Cl. 123—117 A 5 Claims



1. In an ignition timing control device for an internal combustion engine during warm-up, the engine having an intake passage, the combination of: an ignition timing device for the engine, an actuator for said device having two vacuum chambers separated by a flexible diaphragm, first means including a first valve for subjecting the first of said chambers to atmospheric pressure or to suction pressure from said engine intake passage, second means including a second valve for subjecting the second of said vacuum chambers to atmospheric pressure or to suction pressure from said intake passage, a first temperature responsive mechanism controlling operation of said first valve so that below a first predetermined temperature said first valve causes suction pressure to be introduced into said first chamber, a second temperature responsive mechanism controlling operation of said second valve so that above a second predetermined temperature said second valve causes suction pressure to be introduced into said second chamber, whereby increasing engine temperature during warm-up first causes

differential pressure across said diaphragm to advance the ignition timing, then equalizes pressure across said diaphragm to place the ignition timing at a value between retard and advance, and finally causes differential pressure across said diaphragm to retard the ignition timing.

4,094,283

INTERNAL COMBUSTION ENGINE

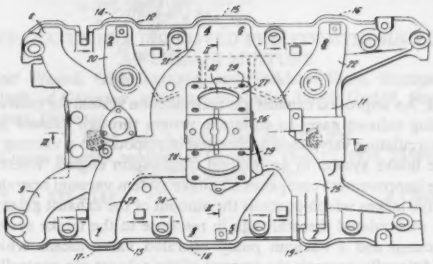
Douglas Leslie Sutton, Solihull, England, assignor to British Leyland UK Limited, London, England

Filed Aug. 20, 1976, Ser. No. 716,208

Claims priority, application United Kingdom, Aug. 19, 1975, 34360/75

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **5 Claims**



1. An internal combustion engine incorporating a plurality of carburetters mounted on the engine by way of a common structural member having a primary duct for each carburetter to allow the passage of fuel/air mixture from a carburetter to the engine and a secondary duct for liquid through the member characterised by the provision of a third duct in the member in the vicinity of, and defining a path in heat exchange relationship with, the primary duct; a pipe linking the third duct upstream of the heat exchange path to an exhaust manifold of the engine; and a passage downstream of the heat exchange path linking the third duct to the primary duct at a region in the primary duct which is downstream of the heat exchange path.

4,094,284

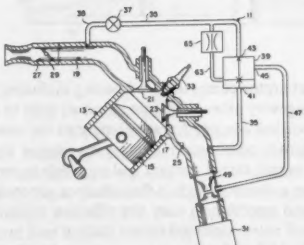
EMISSION CONTROL SYSTEM

William Fred Gesell, Huron, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed Oct. 21, 1975, Ser. No. 624,494

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **43 Claims**



1. An emission control system for an internal combustion engine, the combination comprising:

a fluidic amplifier having a supply port and an outlet port,

a recirculation passageway for connecting the supply port of said fluidic amplifier to a source of exhaust gas having a pressure variable in accordance with the operation of the internal combustion engine and for connecting the outlet port to an intake manifold for recirculating exhaust gas through the engine,

said fluidic amplifier having a power jet chamber in fluid communication with the supply port and a receiver chamber in fluid communication with the outlet port,

said fluidic amplifier having wall means defining an intermediate space between a receiver chamber and the power jet chamber with the nozzle portion of the power jet chamber directed toward the receiver chamber,

said fluidic amplifier having a vent chamber opening into the intermediate space and in fluid communication with a vent port for venting to a relatively low fluid pressure so as to create a differential pressure with the power jet chamber to form a relatively high velocity stream of recirculating exhaust gas acting as a beam for passage through the intermediate space to the receiver chamber with the amount of recirculated exhaust gas varying in accordance with the pressure of the exhaust gas supplied to the supply port,

low pressure means for generating a low pressure relative to the pressure of the exhaust gas being supplied to the inlet port of said fluidic amplifier,

said low pressure means being in the form of a venturi disposed in the exhaust system of the internal combustion engine, and

a vent passageway connecting the vent port of said fluidic amplifier to said low pressure means.

4,094,285

GAS MIXTURE FEED SYSTEM FOR INTERNAL COMBUSTION ENGINE

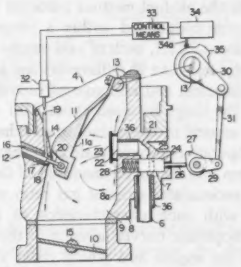
Yoshishige Oyama, Katsuta; Takao Teranishi, Hitachi, and Teruo Yamauchi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 5, 1976, Ser. No. 712,089

Claims priority, application Japan, Aug. 8, 1975, 50-95809

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **11 Claims**



1. A gas mixture feed system for an internal combustion engine wherein said gas mixture feed system comprises:

a carburetor including an intake passageway; a throttle valve in said intake passageway, a movable air valve in the intake passageway upstream of said throttle valve, fuel jet means adjacent said air valve for supplying fuel into fresh air passing thereby, and fuel metering means between a fuel supply source and said fuel jet means and controlled by said air valve;

intake passageway means communicating the outlet of said intake passageway with the internal combustion engine; and

exhaust gas recirculating means for recirculating the exhaust gas from said internal combustion engine to the intake passageway, said exhaust gas recirculating means having an outlet opening disposed in a wall surface of said intake

passageway between said air valve and said throttle valve such that the exhaust gas is fed into the air-fuel mixture downstream of said air valve and said fuel jet means.

4,094,286

INTERNAL COMBUSTION ENGINE AND METHOD OF REDUCING TOXIC COMPOUNDS IN THE EXHAUST GASES THEREFROM

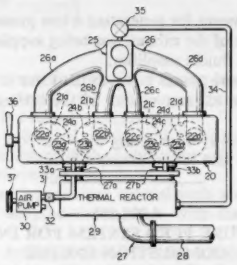
Hiroshi Kuroda, Tokyo; Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, and Shin-ichi Nagumo, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Aug. 24, 1976, Ser. No. 717,408

Claims priority, application Japan, Aug. 25, 1975, 50-103243; Aug. 25, 1975, 50-103244

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **8 Claims**



1. A multiple-cylinder spark-ignition internal combustion engine comprising exhaust-gas cleaning means in the exhaust system; mixture control means by which the ratio of the weight of inactive compounds in the mixture gases produced in the combustion chamber of each of the engine cylinders during each cycle of operation of the cylinder to the weight of the fuel component in the air-fuel mixture inducted into the combustion chamber is maintained within a range between about 13.15:1 and about 22.5:1, each of said engine cylinders having a bore diameter less than 95 millimeters and a bore volume less than 600 millimeters and effective to provide a compression ratio within the range between about 8.0:1 and about 10.5:1, said mixture control means including an exhaust gas recirculation system operative to recirculate the exhaust gases from the exhaust system into the intake manifold of the engine at a rate providing a recirculated exhaust gas ratio which is varied in accordance with such characteristics as are indicated by closed-loop isoplethic curves in terms of the revolution speed and load of the engine and which peaks up during normal steady-state operating conditions of the engine; and an ignition system which includes in the combustion chamber in each of the engine cylinders, a spark plug having a firing point which is located at a distance within a range between about 2 millimeters and 7 millimeters from the internal surface of a wall portion of a combustion chamber in which the spark plug is mounted, said spark plug being disposed so that the volume of the space enclosed within a spherical envelope having a radius r in the combustion chamber about the firing point of said spark plug occupies at least 35 percent of the clearance volume of the combustion chamber, wherein said radius r is given, when measured in meters, by the relation $r = (\theta.Vc)/(6N)$ where θ is the degree of spark advance in terms of crankshaft rotation angle before the top dead center, Vc is the combustion rate in meters per second of the combustible charge in the combustion chamber and N is the revolution speed in rpm of the engine within a predetermined range.

4,094,287

EXHAUST GAS RECIRCULATION SYSTEM

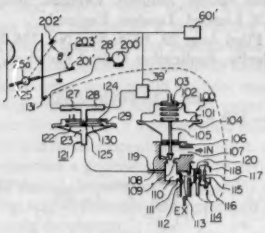
Hidetaka Nohira, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 13, 1976, Ser. No. 750,141

Claims priority, application Japan, Sep. 7, 1976, 51-106212

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **7 Claims**



1. An improved exhaust gas recirculation system for recirculating exhaust gases to an intake system through exhaust gas recirculating valve means operated in response to a vacuum in the intake system in an internal combustion engine, wherein the improvement comprises an intake system vacuum operated valve means which controls the amount of the exhaust gases to be recirculated therethrough in response to the intake system vacuum and a vacuum pump operated valve means which additionally controls the amount of the exhaust gas controlled by said first mentioned valve means in response to a vacuum of an engine-driven or an electrically-driven vacuum pump which always produces a vacuum above a predetermined value during the driving of the vehicle.

4,094,288

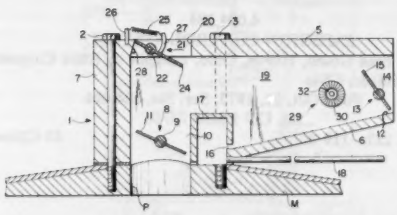
CARBURETOR FOR ENGINES USING DIESEL FUEL

William E. Davis, 762 Lindo La., Port St. Lucie, Fla. 33452

Filed Dec. 18, 1975, Ser. No. 642,053

Int. Cl. F02m *13/06*

U.S. Cl. 123—127 **3 Claims**



1. A carburetor comprising, a housing including walls defining a passageway extending from a first air inlet to and through a throat portion adapted for attachment to the intake manifold of an internal combustion engine, an engine control valve mounted in said throat portion and operable to vary the effective opening therethrough, a first damper pivoted in said first air inlet and operable to vary the effective opening thereof, a fuel control valve mounted to one wall of said housing, downstream of said first damper and upstream of said engine control valve, and operable to introduce atomized fuel into said passageway, manually controlled means positively and directly interconnecting said engine control valve and said fuel control valve for conjoint actuation thereof, pump means supplying diesel fuel to said fuel control valve at pressures of the order of 300 psi, there being a second air inlet in and through the walls of said housing and opening into said passageway downstream

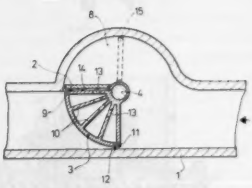
of said fuel control valve and upstream of said engine control valve, a damper plate having a center line, means mounting said damper plate in said second air inlet for pivoting from a first position obturating the same, to a second position, the pivot axis of said plate being offset from its center line, thus urging said plate to second position by differential absolute pressures within and without said housing, and resilient means connected with said plate and urging the same to first position against the urge of differential pressure.

4,094,289

APPARATUS FOR IMPROVED PRECONDITIONING OF A FUEL-AIR MIXTURE

Wolf Wessel, Oberriexingen, and Volkhard Stein, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 4, 1976, Ser. No. 738,924
Claims priority, application Germany, Dec. 12, 1975, 2555997
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **8 Claims**



1. Apparatus for improved preconditioning of the fuel-air mixture in the induction tube of a mixture compressing and externally ignited internal combustion engine with an arbitrarily manipulatable throttle valve, which cooperates with a coaxially arranged, induction tube contained, preconditioning device pivotable against a restoring force by means of the induction air quantity, further characterized in that the induction tube contains an integral laterally extending chamber having an arcuate interior surface into which the throttle valve and a multiple vaned pivotal throttle valve can be rotated.

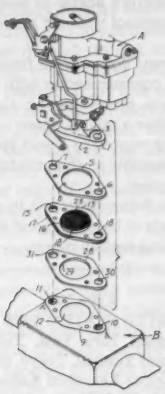
4,094,290

FUEL ATOMIZER

William Odell Dismuke, Memphis, Tenn., assignor to Courtney C. Pace, Washington, D.C.; Ulle C. Linton, Rockville, Md. and Casey C. Pace, Jackson, Miss., part interest to each

Filed Jun. 6, 1974, Ser. No. 477,106
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **1 Claim**

1. A fuel atomizer to be mounted between an internal combustion engine carburetor and intake manifold comprising superimposed metal plates having at least one common central opening, a pair of superposed screens fixedly connected to said plates and extending across said central opening and said screens having portion spaced apart at said central opening and a plurality of balls freely positioned between said spaced apart portions of said screens in the space therebetween, wherein said plates have oppositely raised rims around said opening and



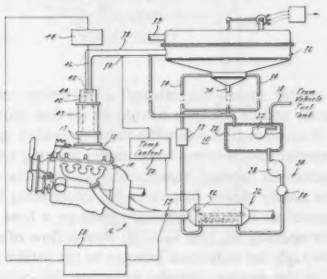
said screens have marginal edges extending in between said rims.

4,094,291

APPARATUS FOR MIXING A VAPORIZED LIQUID FUEL WITH AIR

Douglas R. Hamburg, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1976, Ser. No. 660,310
Int. Cl.² F02M *29/00*
U.S. Cl. 123—141 **5 Claims**



1. A carburetor for mixing a vaporized liquid fuel with air to establish a combustible air/fuel mixture for delivery to an engine comprising in combination:

a carburetor body;

metering venturi means within said body communicating on an upstream end with a source of air and adapted to generate, in use, a low pressure zone having a pressure indicative of the rate of air flow therethrough;

vapor delivery nozzle means situated within the low pressure zone defined by said venturi means and having a vapor delivery orifice operative to deliver a stream of vaporized liquid fuel to the low pressure zone in response to air flow therethrough;

air swirl inducing means situated dowstream from said venturi means arranged to intercept air flowing through said venturi means and operative to cause air flowing through said venturi means to acquire a component of motion at an angle to the direction of flow whereby air flowing therethrough may become a swirling air mass;

said air swirl inducing means including means defining an

aperture in alignment with the vapor delivery nozzle operative to permit a stream of vaporzied liquid fuel issuing from said delivery nozzle to pass therethrough without substantial contact with the air swirl inducing means; and

mixing section means downstream from said swirl inducing means for fluid communication with the engine;

said mixing section means having surface wall portions operative to define a mixing space whereby the swirling air mass and the vaporized liquid fuel may be mixed to establish a combustible air/fuel mixture prior to introduction into the engine;

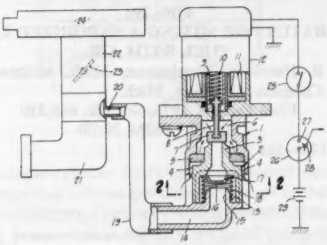
said swirling mass being operative to prevent contact between the vaporized liquid fuel and the surface wall portions of the mixing section means.

4,094,292

HOT STARTER SYSTEM FOR ENGINES

Tadao Takagi, Saitama; Toru Yagi, Tokyo; Mitsuo Ehara, Saitama, and Tatsumi Yamada, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,903
Claims priority, application Japan, Feb. 25, 1976, 51-20427[U]
Int. Cl.[2] F02M *23/04*
U.S. Cl. 123—179 G **8 Claims**



1. A starter means for internal combustion engines in a heated state and of the type having an air-fuel mixture intake passage downstream of a throttle valve provided in a carburetor, the starter means comprising: means forming a supplemental air induction passage communicating with the intake passage; a normally closed first valve for controlling flow of the supplemental air into the induction passage; a heat responsive means for opening the first valve to permit flow of supplemental air through the induction passage to the intake passage on starting of the engine, thereby reducing the richness of the air-fuel mixture therein; and a normally open second valve interposed in the induction passage, the second valve being movable toward a closed position in response to vacuum intensity in the intake passage on complete firing of the engine, thereby to reduce and close off flow of supplemental air through the induction passage to the intake passage, as the richness of the air-fuel mixture therein is reduced.

4,094,293

ENGINE PREOILER AND LUBRICANT RESERVOIR

John W. Evans, Rte. 41, Sharon, Conn. 06069

Filed Apr. 16, 1976, Ser. No. 677,590
Int. Cl.[2] F01M *1/00*
U.S. Cl. 123—196 S **9 Claims**

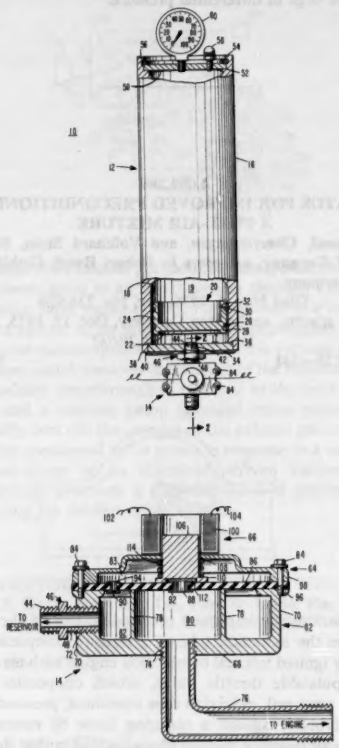
1. A preoiler and lubricant reservoir assembly useable to lubricate and internal combustion engine when the engine's oil pressure is below a specified level, said assembly comprising:

a reservoir, said reservoir being an elongated cylinder, said cylinder having an internal slidable piston, said reservoir storing a quantity of lubricant when said engine oil pressure is above said specified level;

a pressure sensing means for sensing said engine's oil pressure;

means for forcing said lubricant from said reservoir when said oil pressure falls below said level; and

valve means communicating with said reservoir, said valve means allowing unrestricted flow of said lubricant from said reservoir to the engine when the engine's oil pressure is below the specified level, said valve means further



restricting lubricant flow to said reservoir during increasing oil pressure in said engine while said pressure is below said specified level, and said valve means allowing unrestricted lubricant flow to said reservoir once said oil pressure in the engine has risen above said specific level, said valve means including actuating means for controlling said valve means in response to said engine oil pressure sensed by said pressure sensing means.

4,094,294

BALL PROJECTING DEVICE

Richard Speer, Ware Neck, Va. 23178

Filed Jan. 31, 1977, Ser. No. 764,197
Int. Cl.[2] F41F *1/04*
U.S. Cl. 124—56 **26 Claims**

1. In a pneumatic device for projecting a ball, the device comprising a ball-directing tube defining a generally tubular inner space, gas pressure supply means operatively connected to a first end of the tube to provide gas under pressure thereto, means for feeding a ball to the tube for movement in a direction from the first end toward the second end, and detent means in the tube for transiently restraining the movement of a ball therethrough, the improvement comprising:

providing as the detent means a pneumatically operated detent means, the detent means comprising:

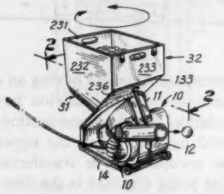
an inflatable, elastically biased membrane within said tube, the membrane having a first inflated configuration extending into the tubular inner space, so as to define a substantially pressure-tight detent volume, and being biased towards the inflated configuration, so as to constrict the tubular inner space and thus restrain the movement of a ball therethrough;

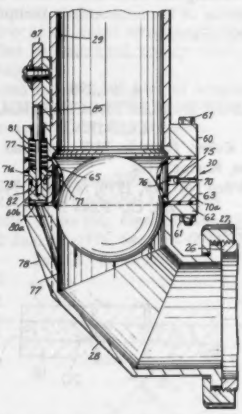
pressure valve means between the detent volume, and the atmosphere;

bias means operatively connected to the pressure valve means and acting to move the pressure valve means into a closed position;

a pressure-responsive means operatively connected to the pressure valve means and acting against the bias means, tending to move the valve means into an open position; and

a pressure chamber and a pressure-connecting means between the pressure-responsive means and the pressure





chamber, the pressure in such chamber being increased when a ball is in place in the tubular inner space and being restrained by the detent membrane, while gas under pressure is being provided to the first end of the tube, whereby at a predetermined pressure in the pressure chamber, the pressure valve means is moved into the open position, so as to substantially immediately permit the deflation of the membrane when a ball is pressed thereagainst and permit passage of the ball therethrough.

10. A pneumatic device for projecting a ball, the device comprising an air box; and gas pressure flow means located therewithin; a ball projection barrel supported on said air box and having an outer portion through which the balls are projected and an inner portion in fluid flow connection with said air box; ball feed channel means extending to the barrel; and a ball feeding means for feeding balls, one at a time, to the feed channel, the feeding means comprising:

a chamber having side walls disposed in a substantially vertical direction and a floor, a portion of the floor being inclined to the horizontal at an angle in the range of from about 35° to about 50°; a feeder disk having a plurality of openings formed therethrough, the disk being rotatably connected to and disposed above the inclined floor surface and being substantially parallel thereto, the floor surface having a ball feed opening so positioned as to be in register with the openings through the disk at the apogee of each opening as the disk rotates; drive means for rotating disk; a raised central portion on the disk extending outwardly and upwardly into the chamber and having a circumferential side surface; a ledge member supported from a side wall surface of the chamber, and having a shelf surface extending outwardly above the upper portion of the disk so that the outer edge of the ledge shelf surface extends along a line forming a chord of the disk and of a disk opening when such opening is in register above the ball feed opening; a transverse ledge surface extending downwardly from the outer edge of the shelf surface, towards the disk; and movable sealing means for the ball feed opening capable of permitting a ball to be fed from the feeder disk when the disk opening is in register with the feeder opening and of sealing the opening after feeding of a ball, whereby pressure in the air box can be increased to a desired pressure for ejecting the ball.

4,094,295

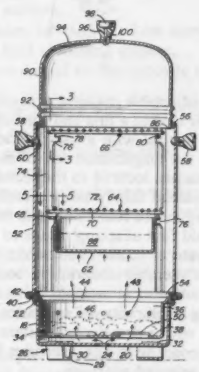
CHARCOAL AND WATER SMOKER AND COOKER

Burl Boswell, and Heyman J. Manhein, both of Shreveport, La., assignors to Bosman Industries, Inc., Shreveport, La.

Filed Jun. 28, 1976, Ser. No. 700,136

Int. Cl.[2] A47J *37/04*; F24B *3/00*

U.S. Cl. 126—25 R **7 Claims**



1. A charcoal-water smoker and cooker comprising a vertically disposed housing comprising a separable main body, supporting base and lid oriented in vertically superimposed relation with the base disposed under the main body and the lid supported on the main body, said base including a fuel receiving pan, said main body including a water pan and a grille disposed above the water pan for receiving food items, said water pan being spaced inwardly of the periphery of the main body to enable passage of smoke and heat upwardly between the pan and main body with the heat vaporizing water in the pan for smoking and cooking the food items on the grille, handle means adjacent the upper end of the main body to enable the main body and lid along with the water pan and grille to be lifted off of the base as a unit with the fuel receiving pan remaining stationary thereby enabling the supply of fuel to be replenished without disturbing the water pan, grille and food items thereon from their position in the main body, the major weight components of the main body including the water pan and grille being disposed so that the center of gravity of the combined unit is substantially below the handle means in order to facilitate retention of the lifted unit in verti-

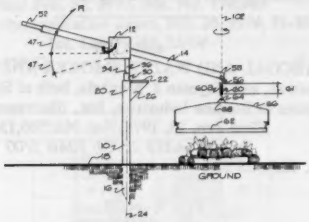
cal orientation, said base including a base pan having supporting legs thereon, said fuel receiving pan being in the form of a liner adapted to receive a quantity of charcoal and supported in concentric spaced relation to the base pan and including a generally horizontal outwardly extending peripheral flange overlying and supported on the base pan with the bottom of the liner spaced from the bottom of the base pan, said liner including openings in the bottom and peripheral wall thereof to provide passage for combustion supporting air, the bottom of said base pan including combustion supporting air inlet means therein, said main body including a lower edge freely resting on the flange of the charcoal receiving liner generally in vertical alignment with the upper edge of the base pan.

4,094,296

PORTABLE ADJUSTABLE OUTDOOR COOKING ACCESSORY

George Beagley, 7545 W. 3100 South, Magna, Utah 84044

Filed Mar. 14, 1977, Ser. No. 777,345
Int. Cl.² F24B *3/00*
U.S. Cl. 126—30 **12 Claims**



1. A portable adjustable cooking accessory comprising:
a stake member having a first end formed into a point and a second end formed with a flange extending substantially normally to the longitudinal axis of said stake member;
first adapting means secured to the second end of said stake member to extend axially away therefrom;
second adapting means removably and cooperatively associated with said first adapting means to permit said second adapting means to rotate about said axis;
an adjustment member secured to said second adapting means, said adjustment member being comprised of a first plate having a plurality of apertures formed therein in accordance with a preselected pattern;
a pin sized to coact with said apertures for removable positioning in a selected aperture;
an elongated arm member pivotally secured to said plate and having a handle on one end and a first hook adapted to its other end;
a chain having links sized to coact with said first hook;
a second hook adapted to one end of said chain to extend below said first hook; and
a cooking utensil suspended from said second hook.

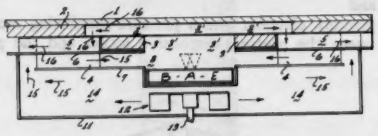
4,094,297

CERAMIC-GLASS BURNER

Earle W. Ballentine, 127 Lomita St., El Segundo, Calif. 90245

Continuation-in-part of Ser. No. 654,113, Feb. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 518,473, Oct. 29, 1974, abandoned. This application Jun. 16, 1976, Ser. No. 696,793
Int. Cl.² F24C *3/04*
U.S. Cl. 126—39 J **22 Claims**

1. A ceramic-glass burner for heating a cooking pan, comprising:
a stoichiometric burner means having particularly spaced apertures for discharging free turbulent jets; a ceramic glass plate above said burner means the linear spacing of these apertures being equal to 2.4 to 2.5 times R d_o T_{RG}/T_{RA} wherein R is the stoichiometric air-to-gas ratio for the fuel gas, d_o is the aperture diameter; means including the glass plate and the burner means for defining a mixing chamber and a combustion chamber between said burner means and said plate;
the free turbulent jets of gaseous fuel being discharged from the stoichiometric burner means into the mixing chamber at the temperature T_{RG} for entraining combustion air entering the mixing chamber for combustion after ignition of the stoichiometric mixture in the combustion chamber above the mixing chamber thereby producing combustion products which have a maximum temperature;



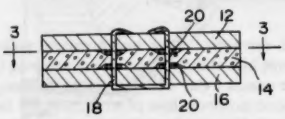
counterflow recuperator means having an upper section and a lower section, the upper section having fins in heat exchange relation with said combustion products so that heat captured by the fins of the upper sections of the counterflow recuperators is transferred to fins of the lower section being disposed in the flow path of the combustion air entering the mixing chamber means, so that the combustion air is preheated to the temperature T_{RA}; and
means for forcing the combustion air to flow through the lower section of the counterflow recuperator means into the mixing chamber.

4,094,298

SEPARATOR IN ELECTROCHEMICAL HEATING ELEMENT

Frederick P. Kober, Bayside, N.Y., assignor to Chem-E-Watt Corporation, Racine, Wis.

Filed Nov. 19, 1976, Ser. No. 743,187
Int. Cl.² F24J *1/04*
U.S. Cl. 126—263 **11 Claims**



1. In an electrochemical heat-generating element of the type having two electrode layers, including an anode and a cathode, a separator layer of porous, absorbent material therebetween, and electrically conductive connector means extending through said electrode and separator layers, the improvement comprising annular spacer means interposed between said electrode layers, said connector means extending through said annular spacer means, whereby to limit compression of said separator layer.

4,094,299

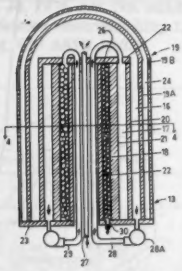
HELIOTHERMODYNAMIC SYSTEM

Percy Voelker, 455 Grant Ave., Brooklyn, N.Y. 11208

Filed Oct. 28, 1975, Ser. No. 626,368
Int. Cl.² F24J *3/02*; B64B *1/50*
U.S. Cl. 126—270 **8 Claims**

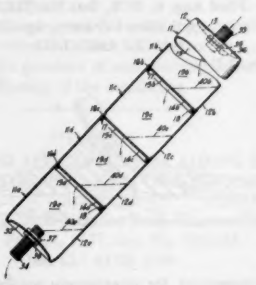
1. A heliothermodynamic system for harnessing solar energy comprising:
a balloon adapted to be floated in the upper reaches of the

atmosphere where the atmospheric absorptions of solar energy is minimized,
means for maintaining said balloon inflated,
means for maintaining said balloon in spaced relationship relative to earth,
said balloon having a transparent portion for transmitting solar light into the interior of said balloon,
a light reflector covering an internal portion of said balloon opposite said transparent portion for concentrating the incident reflected solar radiation toward a focal area thereof,
and a heat receiver located in the focal area of said light reflecting portion of said balloon,



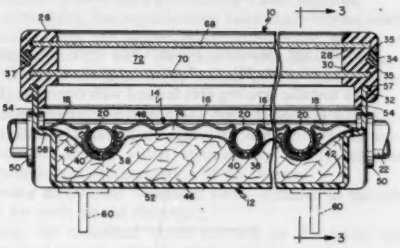
said heat receiver comprises a solar boiler having a plurality of nested, serially connected heating stages including an inner most stage and an outermost stage, and solar radiation absorption means disposed in said innermost stage of said nested heating stages,
and a light transmitting jacket means enclosing said nested stages to define an outermost heating stage, surrounding said nested stages,
said jacket means including a pair of spaced apart light transmitting jackets wherein the space between said jackets defines an area of negative pressure.

4,094,300
SOLAR HEAT COLLECTOR
Sam W. Young, 1305 White Rd., Opelika, Ala. 36801
Filed Jun. 21, 1976, Ser. No. 697,917
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **7 Claims**



1. A solar collection comprising, a plurality of metal soft drink or beer cans of the type which have body portions and tops across the ends of said body portions, the tops having openings therein formed when the cans were opened, each of said cans having an open bottom received by the top of the next adjacent can for forming a series of connected juxtaposed tandem coaxial cans defining successive compartments of a tubular body closed throughout its length and in which said tops of said cans form longitudinally spaced generally radially extending baffles which, when said tubular body is inclined with said openings being respectively spaced above the lowermost inside portions of the adjacent body portions, successive spillways for liquid fed by gravity from the uppermost can of said series and permit the liquid to collect in successive compartments while cascading down through said successive compartments.

4,094,301
SOLAR COLLECTOR PANEL
Edward Fredrick Sorenson, 998 Barrett, Chula Vista, Calif. 92011, and Edward Fredrick Sorenson, Jr., 10136 Swanton Dr., Santee, Calif. 92071
Filed Mar. 19, 1976, Ser. No. 668,441
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **10 Claims**

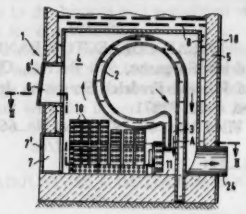


1. A solar collector panel comprising:
a heat absorbing surface,
plural heat collector tubes in the heat conducting relationship with said heat absorbing surface,
manifold tubes connected to the opposite ends of said heat collector tubes,
said heat absorbing surface and said heat collector tubes being mounted on a base,
said base having an upper vertical edge,
at least one glass panel,
a seal molding secured over the upper edge of said base and positioning said glass panel above said heat absorbing surface,
said heat absorbing surface comprising means including a plurality of sheet sections having part cylindrical end flanges for producing a spring action against said heat collection tubes and holding said sheet sections in position on said tubes,
substantially U-shaped clips secured over the junctions of at least one of said flanges and holding said sheet sections in heat conducting relationship with said heat collector tubes.

4,094,302
FURNACE WITH HEAT STORAGE ELEMENTS
Eduard Rohr, Magenwil, Switzerland, assignor to Ed. Rohr AG, Magenwil, Switzerland
Filed Jul. 23, 1976, Ser. No. 708,218
Claims priority, application Switzerland, Jul. 29, 1975, 9841/75
Int. Cl.² F24H *7/04*
U.S. Cl. 126—400 **12 Claims**

1. Furnace and boiler unit having a housing (18), a fire box (2) within the housing, an exhaust connection (24) leading from the housing, and a combustion gas chamber (4) located in the housing,
openings (6) formed in the housing and providing access to the combustion gas chamber, and doors (6', 36', 44', 46') closing off the openings, and comprising
heat storage elements (10) located in the combustion gas chamber (4, 34) and positioned therein in the path of flow

of the combustion gases to increase the flow resistance to the combustion gases, said heat storage elements (10) having a size which is smaller than the largest opening (6: 36, 37, 44, 46) providing access to the combustion gas chamber (4, 34) to allow introduction and removal of the



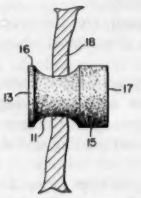
heat storage elements (10) into and from the combustion gas chamber (4, 34), the heat storage elements (1) including a metallic housing (16) formed with openings (12) in at least a portion thereof, and a compact mineral material of high thermal capacity located within said metallic housing (16).

4,094,303

TYMPANIC MEMBRANE VENT

Douglas W. Johnston, Longwood, Fla., assignor to Glasrock Products, Inc., Atlanta, Ga.

Filed Feb. 16, 1977, Ser. No. 769,398
Int. Cl.[2] A61B *19/00*; A61F *1/18*
U.S. Cl. 128—1 R 10 Claims



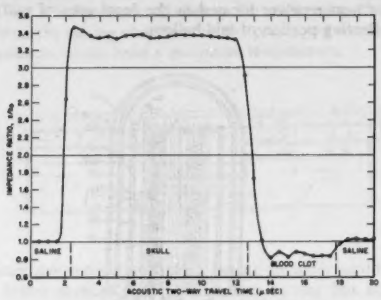
1. A tympanic membrane vent comprising a piece of porous hydrophobic material having pores therein and of a size and shape to be inserted through and held in place extending through the tympanic membrane of the human ear, said piece having a first end surface adapted to be positioned in the middle ear space, a second end surface adapted to be positioned in the ear canal, and exterior side surfaces extending between said end surfaces adapted to engage the tympanic membrane when said piece is in place extending through the tympanic membrane, said end surfaces and said side surfaces defining a closed three-dimensional volume, the interior enclosed by said end surfaces and said side surfaces being filled with said porous material, said pores being interconnected to permit air passage through said interconnected pores between the ear canal and the middle ear space when said piece is in place extending through the tympanic membrane, said pores having a size small enough so that the hydrophobicity of the material prevents passage of water therethrough from the ear canal into the middle ear space when water under atmospheric pressure in said ear canal comes in contact with said piece.

4,094,304

METHOD AND APPARATUS FOR MEASUREMENT OF ACOUSTIC IMPEDANCE TRANSITIONS IN MEDIA SUCH AS HUMAN BODIES

Hubert A. Wright, Jr., Lexington, Mass., assignor to Bolt Beranek and Newman Inc., Cambridge, Mass.

Continuation of Ser. No. 298,027, Oct. 16, 1972, abandoned.
This application Aug. 5, 1974, Ser. No. 494,907
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 V 17 Claims



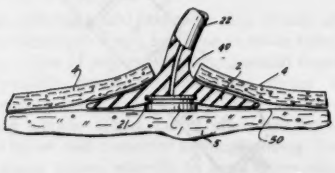
1. Apparatus for identifying and diagnosing parts within the human and animal bodies that comprises means for illuminating at least a portion of a body with acoustic impulse wave energy outgoing along a predetermined direction, whereby the wave energy is returned back in substantially the opposite direction from the body portion as a result of reflection therefrom, means responsive to the outgoing and returning wave energy to produce a resulting reflection impulse-response function, means for integrating the said reflection impulse-response function to provide a measure of impedance transitions in the body portion and means for correlating the same with body portion properties to identify the nature of said body portion.

4,094,305

METHOD AND AN ARRANGEMENT FOR CONTINUOUSLY MEASURING THE PARTIAL PRESSURE OF A GAS IN A SAMPLE

Manfred Kessler, Dortmund-Solde, Germany, assignor to Max Planck Gesellschaft, Munich, Germany

Filed Aug. 6, 1976, Ser. No. 712,248
Claims priority, application Germany, Apr. 23, 1976, 2617766
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 E 13 Claims



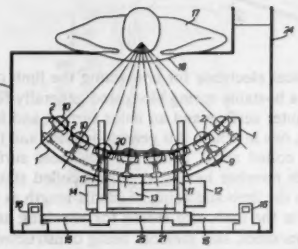
1. An arrangement for continously measuring the partial pressure of oxygen dissolved in blood flowing through muscle tissue which is covered by a skin layer, a combination comprising a support probe having first and second sides which are respectively adapted to engage the underside of the skin layer and the surface of the muscle tissue so that said probe is fixedly held in position against the muscle tissue; and a polarographic cell mounted at said second side and having a gas-measuring part adapted to firmly engage said muscle tissue so as to generate a signal indicative of the amount of gas being diffused from said muscle tissue, said probe further including a tubular sec-

tion connected to said first side thereof, said first side of said probe comprising tapered wall surface portions which diverge in direction from said tubular section towards said muscle tissue so that said tapered wall surface portions are adapted to be positioned in sealing engagement with the underside of said skin layer.

4,094,306
APPARATUS FOR ULTRASONIC EXAMINATION

George Kossoff, Northbridge, Australia, assignor to The Commonwealth of Australia, c/o The Department of Health, Phillip, Australia

Filed Apr. 28, 1976, Ser. No. 681,037
Claims priority, application Australia, May 1, 1975, PC1443
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 V 5 Claims



1. Apparatus for use in the ultrasonic examination of an object, said apparatus comprising:

a housing adapted to be filled with a liquid coupling medium, said housing having a substantially horizontal upper surface and being provided with an aperture in said surface;

a flexible coupling membrane covering said aperture in a liquidtight seal;

transducer means contained within said housing and adapted to be immersed in said coupling medium, said transducer means comprising means for transmitting pulses of ultrasonic energy through said aperture into an object positioned adjacent said aperture and means for receiving echoes of said pulses of ultrasonic energy reflected through said aperture by acoustic impedance discontinuities within the object; and

an open storage header tank for said liquid coupling medium in communication with said housing and the atmosphere to maintain the pressure of said coupling membrane constant during flexing of the membrane.

4,094,307
METHOD AND APPARATUS FOR AIDING IN THE ANATOMICAL LOCALIZATION OF DYSFUNCTION IN A BRAIN

David N. Young, Jr., 2039 Navahoe Trail, Okemos, Mich. 48864

Filed Feb. 24, 1977, Ser. No. 771,683
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.1 B 25 Claims

1. A method for determining the specific anatomical localization of dysfunction in temporal lobe epilepsy comprising the steps of:

placing a plurality of electrodes with respect to physical areas of the subject's brain;

generating a pseudorandom, repeatable, broadband visual stimulus;

summing the broadband visual stimulus on the retina and associated neural networks of the subject;

amplifying the electrical analog response signal measured by each of the placed electrodes;

recording the amplified analog response signal from each electrode;

resynthesizing the broadband visual stimulus;

cross-correlating the resynthesized broadband visual stimulus with the recorded analog response signal for each placed electrode to obtain at least a first, second and third order Wiener kernel representation thereof;

limiting the bandwidth of the visual stimulus by masking out those portions which produce non-significant electrical analog responses;

summing the bandwidth-limited visual stimulus on the retina and associated networks of the subject;

amplifying the bandwidth-limited electrical analog response signal measured by each of the placed electrodes;

recording the amplified bandwidth-limited electrical analog response signals from each electrode;

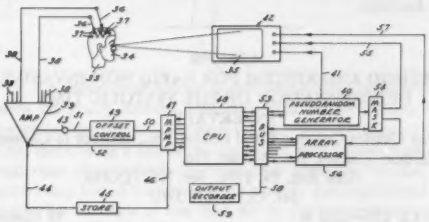
resynthesizing the bandwidth-limited visual stimulus;

cross-correlating the resynthesized bandwidth-limited visual stimulus with the stored bandwidth-limited analog response signal for each electrode to recompute at least a first, second and third order Wiener kernel representation thereof;

synthesizing an optimal kernel-defined visual stimulus Λ for each of said electrodes by multiplying the resynthesized bandwidth-limited visual stimulus by the recomputed Wiener kernel representation of the system;

presenting an optimal Λ-defined visual stimulus to the subject for each placed electrode;

summing the Λ-defined visual stimulus on the retina and associated neural network of the subject;



determining which of the Λ-defined visual stimuli produced neurophysiologically significant responses in the subject; and

utilizing the known locations of those placed electrodes whose Λ-defined visual stimuli produced said significant responses and the nature thereof to specifically isolate the anatomical location of the dysfunction.

18. A system for synthesizing a set of "*n*" discrete optimal visual stimuli, one optimal visual stimulus for each different and distinct brain area being examined, for use in determining the anatomical localization of brain dysfunction, said system comprising:

means for generating a pseudorandom input signal having the general characteristics of Gaussian white noise;

means responsive to said input signal for displaying a color video visual stimulus representation thereof, said visual stimulus being displayed so that it may be summed on the retina and associated neural network of the subject whose brain is being examined;

a plurality of "*n*" individual electrodes, one of said electrodes being disposed adjacent each of said different and distinct brain areas to be examined for monitoring the electrical spikes and slow potential response produced in said areas when said subject observes said displayed visual stimulus;

high impedance, low noise amplifier means having "*n*" channels, each of said channels being coupled to a different and distinct one of said "*n*" electrodes for amplifying the spikes and slow potential electrical analog response signals therefrom;

means for storing the amplified output of each of said "*n*" channels;

computational means responsive to said storage means and to said input signal-generating means for cross-correlating a resynthesized input signal with said stored electrical analog response signal for computing a Wiener kernel representation of the response from each of said electrodes for determining which portions of said input signal gave rise to insignificant responses;

means responsive to a determination of which portions of said input signal were responsible for insignificant responses for masking out the subsequent generation thereof so as to limit the bandwidth of any subsequently generated input signals;

said computational means being responsive to the resynthesized subsequently regenerated bandwidth-limited input signal and to the subsequently stored electrical analog response signals measured by said electrodes in response to the subject's observation of the displayed bandwidth-limited visual stimulus resulting from said bandwidth-limited input signal for cross-correlating to obtain a recomputed Wiener kernel representation of the output of each of said electrodes; and

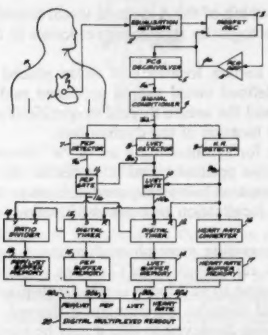
array processor means responsive to said recomputed Wiener kernel representation of the output of each of said electrodes and to the resynthesized bandwidth-limited input signals for multiplying same to produce an optimal input signal for each of "*n*" electrodes which can be supplied to said display means for displaying an optimal visual stimulus for testing each of said different and distinct brain areas being examined to anatomically localize brain dysfunction.

4,094,308

METHOD AND SYSTEM FOR RAPID NON-INVASIVE DETERMINATION OF THE SYSTOLIC TIME INTERVALS

Denny Charles Cormier, Coral Gables, Fla., assignor to Cormier Cardiac Systems, Inc., Miami, Fla.

Filed Aug. 19, 1976, Ser. No. 715,895
Int. Cl.[2] A61N 5/02
U.S. Cl. 128—2.05 R **18 Claims**



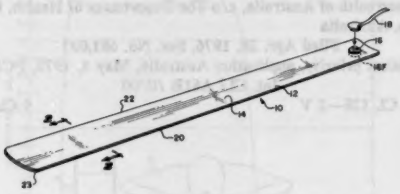
1. In a method for the non-invasive determination of cardiac performance by measuring the systolic time intervals (STI), the steps of transducing the heart sounds into an electrical phonocardiogram signal, subjecting the phonocardiogram signal to an inverse filtering system specifically matched in accordance with formulae equivalent to TRW(*t*) for detection of cardiac valvular events as derived from fundamental biophysical parameters of the heart for extraction of said systolic time interval events from the phonocardiogram signal, extracting systolic time interval events from the phonocardiogram signal after thus being subjected to said inverse filtering system, electrically measuring intervals between said systolic time interval events, and finally indicating said systolic time intervals for interpretation as indicia of cardiac performance.

4,094,309

MEDICAL ELECTRODE

Robert M. Grzenia, 9717 S. Homan Ave., Evergreen, Ill. 60642

Filed Mar. 7, 1977, Ser. No. 774,858
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.06 E **10 Claims**



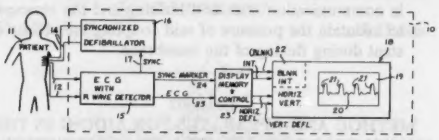
1. A medical electrode for contacting the limb of a patient comprising a bi-stable spring elongated generally flat member having an outer surface and an inner surface and having two stable states, one in which it is generally linear and the other in which it is coiled about itself, with its inner surface facing inward, such member having a natural coiled state of a size smaller than the limb and being of such a length as to substantially encircle the limb, and means for attaching an electrical lead to the member, said member being constructed such that an electrically conductive path exists from at least a portion of the inner surface of said member to and through said electric lead attaching means to any electrical lead attached thereto, and said member having the property of naturally assuming the coiled state from the linear state in response to slight change in its shape.

4,094,310

APPARATUS FOR ENHANCED DISPLAY OF PHYSIOLOGICAL WAVEFORMS AND FOR DEFIBRILLATION

Robert A. McEachern, Wellesly, and George A. Cavigelli, Lexington, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Oct. 4, 1976, Ser. No. 729,442
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.06 G **19 Claims**



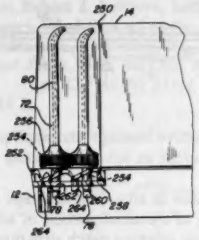
1. In a system for displaying a physiological waveform, means for generating an electrical signal representative of a particular physiological waveform; means for generating an electrical signal indicative of the occurrence of a preselected event in timed relation to said physiological waveform signal; a cathode ray tube; and display control means responsive to said physiological waveform signal and to said event signal for controlling the display by said cathode ray tube, said display control means including means for providing time-successive samples of said physiological waveform signal, a recirculating memory for the storage of a successive plurality of waveform samples, means for entering data representative of said event signal in said memory in the same said time relation with said waveform samples as said event bears to said physiological waveform signal, means responsive to said successive waveform samples in memory for controlling the deflection of the

beam of said cathode ray tube in at least one coordinate direction to provide a trace representative of said waveform and means responsive to said stored event date for variably controlling the intensity of the beam of said cathode ray tube as a primary modulation of the waveform trace to provide a visibly distinguishable event marker and for secondarily modulating said primary modulation of said waveform trace to further enhance display of the event marker.

4,094,311
DENTAL SYRINGE

Raymond A. Hudson, Ft. Collins, Colo., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.

Filed Apr. 21, 1977, Ser. No. 789,453
Int. Cl.[2] A61H *9/00*
U.S. Cl. 128—66 **7 Claims**



1. In a hygienic appliance having means for delivering liquid under pressure through a hose to a detachable elongated nozzle and including a base assembly together with a removable cover therefor, the improvement comprising:

a shelf assembly supported on said base assembly for slidable movement between a first position concealed within said cover when the latter is in place and a second position projecting outwardly from said base assembly when said cover is removed;

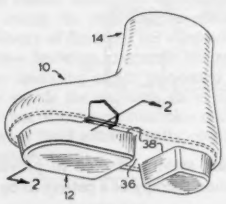
means defining an opening in said shelf assembly receptive of one end of said nozzle to hold the latter in an upright position;

and means included within said shelf assembly for effecting an outward tilt of the upper end of said nozzle away from said base assembly when said shelf assembly is moved to said second position.

4,094,312
WALKING BOOT FOR SURGICAL LEG CAST

Francis Whyte, 2 Cascade Dr., Halifax, Nova Scotia, Canada

Filed Dec. 13, 1976, Ser. No. 749,916
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—83.5 **11 Claims**



1. A boot, for use with a surgical plaster of Paris leg cast, comprising:

a shoe formed of a sheet member of substantially rigid, weight supporting material having an outline substantially similar to the profile of the underside of a foot, a pair of wells of similar depth formed in the sheet member, one well being located in the forward portion of the sheet member and of an area substantially covering the weight bearing area of the sole portion of the foot, the other well being located in the rearward portion of the sheet member and of an area substantially covering the weight bearing area of the heel portion of the foot, the edge portion of the sheet material forming a peripheral flange; and

a flexible upper constructed and arranged to receive therein the foot portion of the cast, the lower periphery of the upper being inturned to form a bottom having apertures therein to receive the wells of the shoe whereby the wells project downwardly through the apertures.

4,094,313
INTRA-UTERINE DEVICE AND TOOL FOR INSERTION OF SAME

Takeo Komamura, 4-9-11 Nishigahara, Kitaku, Tokyo; Tadao Okamoto, 1-12-8 Kohinata, Bunkyoku, and Atsumi Ishihama, 3-6-30 Kagano, Morioka, all of Japan

Filed Oct. 29, 1976, Ser. No. 737,017
Claims priority, application Japan, Jun. 13, 1975, 50-79399[U]; Jul. 16, 1975, 50-5097816[U]
Int. Cl.[2] A61F *5/46*
U.S. Cl. 128—130 **13 Claims**

1. An intrauterine device comprising a stem, a plurality of arms integrally formed with said stem and projecting from opposite sides thereof, the stem-remote ends of said arms being free, there being a line of integration of each of said arms with said stem about which the respective arms are flexible, said arms being biased for normally presenting the longitudinal axes thereof at an angle of less than 90° to the longitudinal axis of said stem and within the plane of said stem, the line of integration of each arm forming an angle of less than 90° with the longitudinal axis of said stem whereby upon flexure the outer portions of said arms will depart from the plane of said stem.

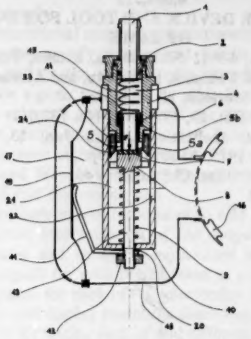
4,094,314
PRESSURE REGULATOR FOR BREATHING APPARATUS

Jacques Le Cornec, Saint Esteve, France, assignor to Gilles Atlan, Marseilles, France

Filed Jun. 10, 1976, Ser. No. 694,819
Claims priority, application France, Jun. 30, 1975, 75 20858
Int. Cl.[2] A62B *7/00*
U.S. Cl. 128—142.2 **6 Claims**

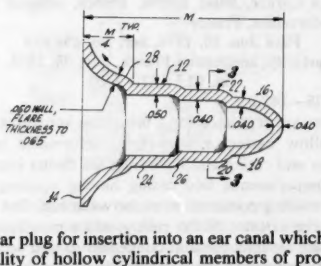
1. A pressure regulator for a breathing apparatus comprising: a hollow casing, a semi-rigid, deformable membrane mounted in said casing and separating the casing into first and second compartments; said casing having openings formed therein providing communication between said first compartment and the exterior of the casing; and a mouthpiece and a low pressure air inlet conduit connected to said second compartment; a regulating valve located in said second compartment for controlling the delivery of air from said inlet conduit to said second compartment, said valve including a valve seat; a valve head, a sealing pellet mounted in said valve head, a control rod having a first end secured to said valve head and a second free end, opposite said first end, and return spring means for maintaining said pellet sealingly applied against said valve seat; a lever located in said second compartment having

one end operatively connected to the free end of said control rod and an opposite end operatively connected to said semi-rigid membrane for automatically displacing said control rod and said valve head away from said valve seat when the pressure in said first compartment is greater than the pressure in said second compartment, said regulating valve including a cylindrical chamber mounted in said second compartment in communication with said inlet conduit, said valve head and control rod slidably mounted in said cylindrical chamber, a nozzle slidably mounted in said cylindrical chamber for sliding movement coaxial with said valve head, said nozzle having axially opposed front and rear ends with said front end facing said valve head and defining said valve seat and said rear end



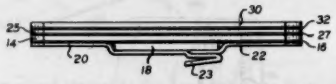
including a hollow piston having two opposite front and rear faces located within said cylindrical chamber; said cylindrical chamber having two opposite ends including a rear end connected to said inlet conduit for low pressure air and a front end forming an abutment for the front face of the piston, whereby when said inlet conduit is supplied with compressed air the rear face of said piston is subjected to the pressure of the air in said chamber and the piston is maintained in a fixed position with its front face in abutment against the front end of said cylindrical chamber by said pressure, and when the inlet conduit is not connected to compressed air the rear face of the piston is no longer subjected to pressure and the piston retracts inside said chamber and draws back the nozzle and valve seat.

4,094,315
EAR PLUG
Charles Leight, 118 S. Orlando Ave., Los Angeles, Calif. 90048
Filed Oct. 29, 1976, Ser. No. 736,885
Int. Cl.[2] A61F *11/02*
U.S. Cl. 128—152 **1 Claim**



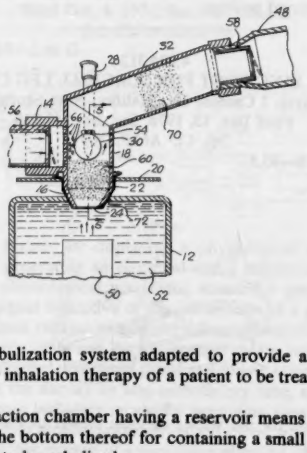
1. An ear plug for insertion into an ear canal which includes:
a plurality of hollow cylindrical members of progressively larger diameters sizes, the smallest of said cylinders being closed at its free end, and each cylinder being connected to the next larger cylinder by a transition member;
the wall thickness of said cylindrical members being varied from the thinnest in said smallest cylinder to the thickest in said largest cylinder; and
a hollow conical member open at both ends with its smaller end connected to the largest of said cylindrical members by a transition member, said conical member having a thickness greater than any of said cylindrical members and a mechanical strength sufficient to enable it to be grasped to remove said ear plug from the ear whereby, the wall thickness of said cylindrical members is such as to prevent the collapse of said cylindrical members while permitting said cylindrical members to conform to the shape of an ear canal and said transition members act to stiffen said cylindrical members.

4,094,316
ADHESIVE BANDAGE WITH REUSABLE APPLIQUE
Eric Nathanson, 2618 Batchelder St., Brooklyn, N.Y. 11235
Filed Aug. 26, 1976, Ser. No. 717,600
Int. Cl.[2] A61L *15/00*; A41H *27/00*; B32B *35/00*
U.S. Cl. 128—156 **7 Claims**



1. A combined adhesive bandage and applique comprising:
an adhesive tape having an adhesive coating on at least one face thereof;
a bandage pad smaller in area than said tape secured by the adhesive coating to a central portion of said tape;
a decorative applique clothing patch strip dimensioned of an area substantially congruent to that of said adhesive tape, and formed with a continuous web of material having a pressure sensitive reusable adhesive layer along one entire surface of said web releasably secured with respect to said tape on the side thereof opposed to the side of the tape to which said bandage is secured.

4,094,317
NEBULIZATION SYSTEM
Richard D. Wasnich, 2408 Halekoa Dr., Honolulu, Hi. 96821
Filed Jun. 11, 1976, Ser. No. 694,957
Int. Cl.[2] A61M *11/00*
U.S. Cl. 128—194 **16 Claims**



1. A nebulization system adapted to provide a nebulized aerosol for inhalation therapy of a patient to be treated, which comprises:
an interaction chamber having a reservoir means positioned near the bottom thereof for containing a small amount of liquid to be nebulized;
ultrasonic nebulizer means disposed below said reservoir means and said interaction chamber for nebulizing said small amount of liquid into an aerosol to be received by said interaction chamber;

means positioned within said interaction chamber above said nebulizer means for initially maintaining the position of said aerosol therebelow for increasing the concentration thereof and for causing the larger particles of said aerosol to be impacted thereon and thereby be recovered by renebulization;

outlet conduit means in communication with said interaction chamber for receiving said aerosol and including means for delivering same to the patient upon commencement of inspiration by said patient; and

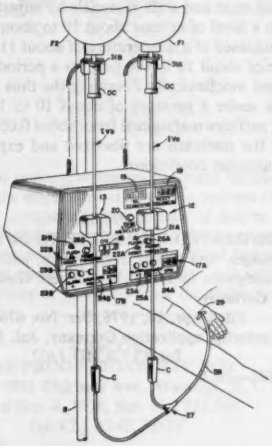
air inlet conduit means in communication with said interaction chamber including means for providing air flow behind said aerosol after commencement of inspiration by said patient.

4,094,318

ELECTRONIC CONTROL MEANS FOR A PLURALITY OF INTRAVENOUS INFUSION SETS

George K. Burke; Robert J. LeFevre, both of Bethlehem, and Robert E. Thomas, Wind Gap, all of Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Filed Jul. 9, 1976, Ser. No. 703,907
Int. Cl.[2] A61M *31/31*
U.S. Cl. 128—214 E, 23 Claims



23. A multiple intravenous infusion means for independently and consecutively controlling flow of separate intravenous fluids through a plurality of intravenous infusion sets, including: a plurality of intravenous infusion sets; valve means associated with each set; valve operating means for opening and closing each valve means at a preselected rate; selector means for enabling one valve operating means and disabling the other; and alarm means associated with at least one of said valve operating means for detecting deviations between the actual rate of delivery of fluid and the selected rate and operative in response to a deviation to operate said selector means to disable the valve operating means associated with the alarm condition and to enable the alternate valve operating means, whereby in the event of an alarm condition occurring in one of the sets, intravenous fluid automatically continues to be supplied through another set.

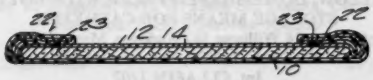
4,094,319

SANITARY PAD WITH MULTIPLE END FOLDS

Curt G. Joa, Box 1121, Boynton Beach, Fla. 33435

Filed Nov. 1, 1976, Ser. No. 737,750
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—284 5 Claims

1. In a disposable sanitary pad which includes a top sheet, a back sheet, and an absorbent pad sandwiched therebetween, the absorbent pad being shorter and narrower than the back sheet, the improvement comprising plural folds in the opposing end margins of said back sheet and including corresponding first folds in which the end margins of the back sheet are doubled back over themselves to form waistbands extending



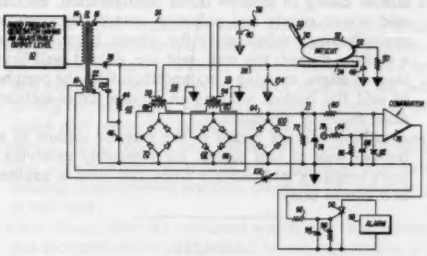
beyond the ends of the absorbent pad and corresponding second folds in which the waistbands thus formed are folded back over the end margins of the absorbent pads, thus to reduce the length of the folded sanitary pad to the approximate length of said absorbent pad.

4,094,320

ELECTROSURGICAL SAFETY CIRCUIT AND METHOD OF USING SAME

David W. Newton, and Frank A. Alford, both of Boulder, Colo., assignors to Valleylab, Inc., Boulder, Colo.

Filed Sep. 9, 1976, Ser. No. 721,821
Int. Cl.[2] A61B *17/36;* A61N *3/00*
U.S. Cl. 128—303.14 15 Claims



1. An electrosurgical generator comprising

a radio frequency generator;

an electrosurgical instrument having an active electrode suitable for application to a patient;

an active lead connected between said generator and said active electrode for conducting current from said generator to said active electrode;

a patient electrode adapted for connection to said patient to provide a low impedance path for current from said active electrode;

a patient lead connected between said generator and said patient electrode for conducting current from said patient electrode back to said generator; and

a safety circuit means for detecting only an excess of active lead current with respect to patient lead current to thereby indicate a discontinuity in a patient circuit including said patient electrode and said patient lead;

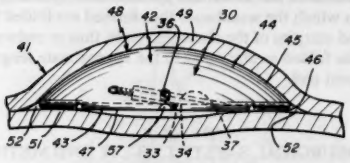
the level of the output signal from said radio frequency generator being adjustable and said safety circuit means detecting an excess of current in the active lead with respect to current in the return lead and including threshold means for indicating an alarm condition when the active lead current exceeds the patient lead current by a threshold level established by said threshold means, said threshold means including compensating means for dynamically varying said threshold level, said compensating means being responsive to adjustments in the output signal level of said generator to make said safety circuit means responsive to expected differences of said active and patient lead currents under normal conditions to thereby both provide a sensitive threshold in a variety of condi-

tions and to offset the tendency of said signal adjustments to prematurely generate said alarm condition when there is no danger to said patient.

4,094,321
SHALLOW, DOME-SHAPED PACER WITH BOTTOM STORAGE MEANS FOR CATHETER

Rudolph Muto, 24 Williams St., Andover, Mass. 01810

Filed Feb. 7, 1977, Ser. No. 765,888
Int. Cl.[2] A61N *1/02*
U.S. Cl. 128—419 P **11 Claims**



1. A heart pacer of the type having a casing with a power supply and pulsation control circuitry therewithin and having a catheter connector socket with a clamp screw operable therein for removably receiving a catheter prong, said pacer characterized by:

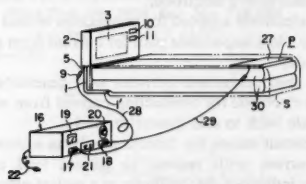
a hollow casing of shallow dome configuration, enclosing said power supply and pulsation control circuitry, said casing having a substantially flat, planar, bottom wall and a shallow domed, top wall, said top, domed wall having tapered edges, merging a juxtaposition with the periphery of said flat bottom wall, in an arcuate cross-section of small radius of curvature;

and catheter storage means in the exterior surface of said bottom wall of said casing, for releasably receiving an extra length of said catheter when said pacer is implanted in a human body.

4,094,322
THERAPEUTICAL APPARATUS USING ELECTRIC FIELD

Katsumasa Hara, Tokyo, Japan, assignor to Hakuju Institute for Health Science Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1976, Ser. No. 697,365
Int. Cl.[2] A61N *1/40*
U.S. Cl. 128—419 N **4 Claims**



1. A therapeutical apparatus using electric field comprising a main electrode arranged at the head end of a support surface on which a patient lies, a further electrode arranged at the foot end of said support surface, insulated conductors, connected to the respective electrodes, for enabling a voltage having an AC component to be applied to the electrodes, a monitoring means for enabling monitoring of the continuity of an electrical circuit formed by said main electrode and the said conductors connected thereto when a voltage is applied to said main electrode, said monitoring means being disposed adjacent to the main electrode and being connected in a circuit which includes said electrodes and which is completed through the body of the patient when the patient contacts the further electrode and said monitoring means, said monitoring means comprising a conductive plate and an insulating plate connected to the face of the conductive plate and adapted to be contacted by the patient, and a detecting means, operative respective to the monitoring means being touched by the patient, arranged between the conductive plate and the main electrode, said detecting means comprising an indicator device which is energized when a said voltage is being applied to said main electrode and which is not energized when a voltage is not being applied to said main electrode to thereby enable faults to be detected in the said circuit formed by the main electrode and the conductors.

4,094,323
SMOKING ARTICLE AND METHOD

Thomas Cecil Frazier, Hopewell; John Thomas Ashworth, Richmond; Richard Douglas Caumney, Jr., Mechanicsville, all of Va., and René Wilhelm Meyre, Reidsville, N.C., assignors to American Brands, Inc., New York, N.Y.

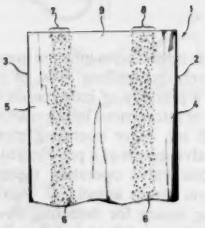
Filed Feb. 9, 1976, Ser. No. 656,264
Int. Cl.[2] A24B *3/18*; A24D *1/06*
U.S. Cl. 131—8 R **10 Claims**

1. The method of making expanded and fiberized tobacco stem and stalk materials having increased filling capacity and suitable for use as filler in smoking articles comprising conditioning said stem and stalk materials by adjusting the moisture content to a level of at least about 10 to about 50% by weight while maintained at a temperature of about 115° to 170° C. and a pressure of about 10 to 100 psig for a period of from 0.1 to 5 minutes and mechanically fiberizing the thus treated materials while it is under a pressure of about 10 to 100 psig between fiberizing surfaces maintained from about 0.05 to 0.3 inch apart such that the materials are fiberized and expanded when exposed to ambient conditions.

4,094,324
PERFORATED CIGARETTE TIPPING PAPER

Otto Bolsinger, and Ingolf Seckelmann, both of Herne, Germany, assignors to Deutsche Benkert GmbH & Co., K.G., Herne, Germany

Filed Apr. 14, 1976, Ser. No. 676,984
Claims priority, application Germany, Jul. 12, 1975, 2531285
Int. Cl.[2] A24D *1/02*
U.S. Cl. 131—10 A **4 Claims**



1. In a cigarette having at one end, an air permeable filter having a defined porosity along the exterior thereof, a cigarette tipping paper receivable on the exterior of the filter to form a filter tip having a porosity approaching that of the filter alone, said tipping paper having a width in excess of the length of the filter and a length which is at least as great as the circumference of the filter, said paper having at least one perforated zone which is arranged in the longitudinal direction of the paper and having a width corresponding to a fraction of the width of the paper, said zone being bordered by first and second unperforated edge strips which receive the tobacco containing portion of the cigarette and the lips of the user, respectively, said perforated zone containing a plurality of minute perforations normally invisible to the naked eye and formed by high tension spark erosion, said perforations being irregular in shape, size

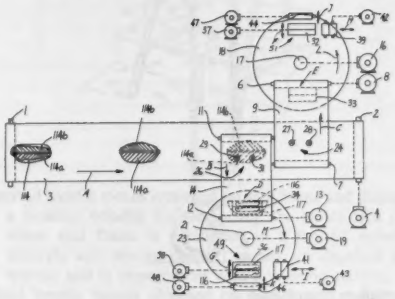
and location within said zone and present in a sufficient number to provide a porosity to the zone for establishing the porosity of the filter tip inclusive of the tipping paper at that approaching the porosity of the filter alone.

4,094,325

METHOD AND APPARATUS FOR MAKING WRAPPERS FOR CIGAR BUNCHES

Helmut Stoffers, Geesthacht, and Rudolf George, Hamburg, both of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Aug. 19, 1976, Ser. No. 715,693
Claims priority, application Germany, Sep. 2, 1975, 2538964
Int. Cl.[2] A24C *1/00, 1/04*
U.S. Cl. 131—21 R **27 Claims**



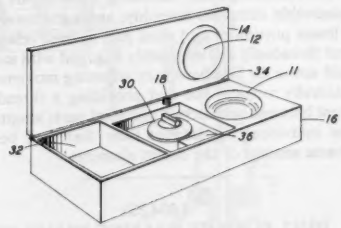
1. A method of making wrappers for cigar bunches or the like, comprising the steps of monitoring the outlines of tobacco leaves, including comparing the outlines of leaves with the outline of a satisfactory wrapper and producing signals when said comparing step indicates that a monitored leaf is capable of yielding at least one satisfactory wrapper; and utilizing said signals for the cutting of wrappers from the respective leaves.

4,094,326

FIRE PROOF CIGARETTE BOX

Robert Newman, 1891 Oakland Ave., Wantagh, N.Y. 11793

Filed Sep. 8, 1976, Ser. No. 721,206
Int. Cl.[2] A24F *19/10*
U.S. Cl. 131—234 **3 Claims**



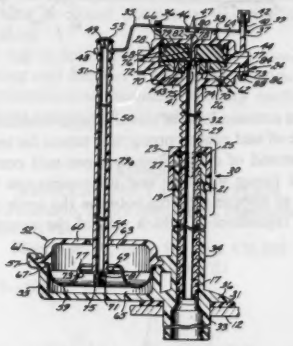
1. An ashtray comprising: a housing; a removable cover fitted thereto for closing the ashtray and thereby snuffing out lit combustible material in the ashtray; audible alarm means having a wind-up spring type alarm including a timing mechanism, a bell and a hammer for striking the same; and alarm interrupter means within said housing including a spring urged plunger, a pivoted link, and a damper cushion, said spring urged plunger cooperating with said cover on one end thereof, the other end of said plunger contacting one end of said pivoted link, the other end of said pivoted link having said damper cushion secured thereto, the closing of said cover urging said plunger which then pushes said one end of the pivoted link causing said damper cushion to diminish the audible signal of said bell.

4,094,327

FLUID CONTROL DEVICE

Anthony R. Brandelli, 2418 W. 256th St., Lomita, Calif. 90717

Filed Feb. 7, 1977, Ser. No. 766,356
Int. Cl. F16k *21/18*
U.S. Cl. 137—403 **29 Claims**



1. A liquid level responsive valve for mounting in a tank having bottom wall inlet and outlet ports which comprises:

a valve housing having a cover member received on a bottom plate member defines an interior chamber, the latter having an inlet port, valve seat means thereabout, and outlet port means for discharging into said tank;

a vertical, liquid conduit with a first end in open communication with said tank inlet port and supporting said valve housing at an elevated position, about the full liquid level, in said tank;

a valve closure member contained within said valve housing and moveable between open and closed registration with said valve seat means;

valve member actuator means extending from the chamber of said valve housing exteriorly thereof;

a flexible valve actuator arm with one end secured for pivotal movement to the exterior of said housing and interconnected with said valve closure member to move said member between said open and closed positions upon pivotal movement of said actuator arm;

an actuator housing formed of a cover plate member received on a cup member for mounting on the fllor of said tank;

a flexible diaphragm peripherally sealed to the inner walls of said actuator housing and extending thereacross to subdivide said housing into superior and subjacent chambers;

a central aperture in said cover plate member of said housing;

a vertical vent conduit extending through said central aperture and vertically coextensive with said liquid inlet conduit, centrally carried on said flexible diaphragm in open communication with said subjacent chamber;

liquid vent means opening said superior chamber to said tank; and

attachment means securing the free end of said actuator lever arm to the upper end of said vertical vent conduit.

4,094,328

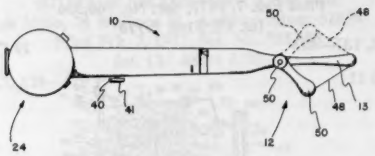
DENTAL FLOSS MANIPULATING INSTRUMENT

Gerald E. Ray, Rte. 1, Wake Forest, N.C. 27587

Filed Jul. 8, 1976, Ser. No. 703,638
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—91 **1 Claim**

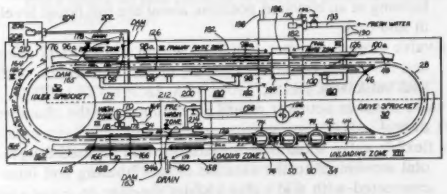
1. A dental floss manipulating instrument comprising: an

elongated handle means; a fork means at one end of said handle and including a central prong having a base portion adjacent said handle disposed in general longitudinal alignment with such handle; an elongated side prong pivotably connected at one end to the base portion of said central prong and being releasably pivotable from one side of said central prong to the



other with an extreme limit of travel of approximately 90°, 45° on either side of said central prong; and means for tensioningly attaching a strand of dental floss between said central prong and said side prong whereby said instrument can be readily manipulated to dispose the floss between the teeth of the user of the same regardless of which side of the mouth is being flossed.

4,094,329
APPARATUS FOR WASHING AND SANITIZING CONTAINERS
Grover C. Evans, P.O. Box 1124, Little Rock, Ark. 72203
Filed May 27, 1977, Ser. No. 801,165
Int. Cl.² B08B 3/02
U.S. Cl. 134—56 R **8 Claims**



1. Apparatus for washing and sanitizing containers comprising:

a housing having a plurality of treatment zones comprising: wash, pre-rinse, primary rinse, and final rinse zones disposed successively along a predetermined path between loading and unloading zones;

a conveyor orbitally movable along said path, said conveyor comprising a plurality of container supports each adapted to hold a container in upside down condition for movement successively through said treatment zones;

spray means in each of said treatment zones positioned to spray inside and outside walls of a container on said conveyor;

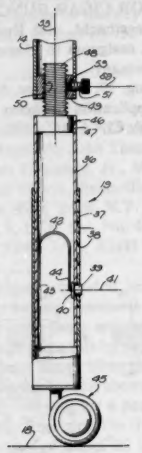
liquid conduit means connecting the spray means in the final rinse zone to a source of fresh water under pressure;

means for collecting and combining liquid sprayed in both said primary rinse zone and said final rinse zone and directing such combined liquid to a common reservoir;

first pump and conduit means for using rinse water at least a second time by directing it from said common reservoir to the spray means in said pre-rinse and primary rinse zones; and

second pump and conduit means for recycling sanitizing solution between a sanitizing solution reservoir and the spray means in the wash zone.

4,094,330
WALKER
Slosson B. Jong, 20722 Hunter La., Huntington Beach, Calif. 92646
Filed Jan. 14, 1977, Ser. No. 759,458
Int. Cl.² F16M 13/08
U.S. Cl. 135—67 **6 Claims**



1. A walker comprising:

a frame structure having handle portions to be gripped by the two hands of a user, and having a plurality of downwardly projecting support legs;

individual ones of said legs including a lower removable extension assembly having a lower part and an upper part in the form of a tube telescopically interfitting with said lower part for longitudinal essentially vertical adjustment of the lower part relative to the upper part, a detent element carried by one of said parts and releasably receivable within any of a plurality of detent openings in the other part to releasably retain the parts in differently adjusted positions providing a coarse length adjustment for the individual legs, and a screw having a lower portion secured within an upper portion of said second part in fixed relation thereto and having a threaded shank projecting upwardly beyond said second part;

said individual legs also including a third part above said removable extension assembly, and a nut received within a lower portion of said third part in fixed relation thereto and threadedly and adjustably engaged with said shank of said screw for relative rotary adjusting movement about a generally vertical axis and providing a threaded adjustment between said second and third parts longitudinally of the individual leg lengths finer than and between the coarse settings of the detent elements.

4,094,331
DUAL PURPOSE WALKING FRAME FOR HANDICAPPED PERSONS
Peter Rozsa, Mazal Dagim 11, Old Jaffa, Jaffa, Israel
Filed Feb. 16, 1977, Ser. No. 769,151
Int. Cl.² F16M 13/08; A61H 3/00
U.S. Cl. 135—67 **8 Claims**

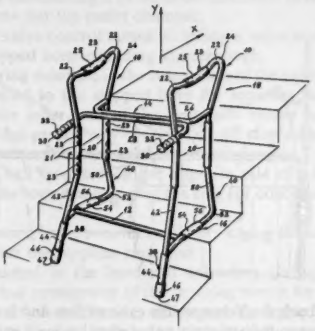
1. A dual purpose invalid walking frame for use on walking surfaces and on stairs comprising:

first support means defining at least three support points lying in two vertically separated planes and arranged to engage two stair surfaces;

second support means defining at least three support points lying in a plane and arranged to engage a walking surface, said first and second support means being fixedly joined

together in a rigid configuration to define generally opposite ends of a frame;

first handle means disposed on said frame at a location suitable for supporting the hands of a person descending stairs when said frame is positioned in a first orientation wherein said first support means are oriented downwardly and in stair engagement;



second handle means arranged on said frame and disposed at a location suitable for supporting the hands of a person when said frame is positioned in a second orientation wherein said second support means are disposed downwardly and in engagement with a walking surface; and

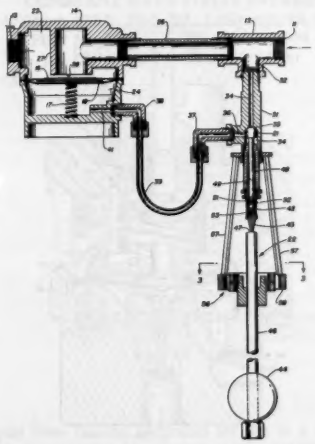
third handle means disposed on said frame at a location suitable for supporting the hands of a person ascending stairs when said first support means are oriented downwardly and in stair engagement.

4,094,332

EARTHQUAKE-RESPONSIVE FUEL SHUT-OFF DEVICE

Joseph F. Poff, and Jerry W. Poff, both of 89 Bishop Rd., Crockett, Calif. 94525

Filed Oct. 12, 1976, Ser. No. 731,362
Int. Cl.² F16K *17/36*
U.S. Cl. 137—46 **6 Claims**



1. An earthquake-responsive fuel shut-off device adapted for insertion in a fuel line connected to a fuel source under pressure comprising:

a main valve and a fluid-pressure-responsive actuator therefor for maintaining said valve in fluid flow open position in response to a fuel-line-imposed pressure differential and including means biasing said valve to flow shut-off position in the absence of said differential;

means providing a fluid-line-connected passage to said actuator for placing said line pressure in opposition to and equalizing said pressure differential to effect closing of said valve by said biasing means;

a second valve in said passage movable between open and closed positions therein;

a spring urging said valve to open position;

a member having a position engaged with and supporting said valve in closed position against the urge of said spring; and

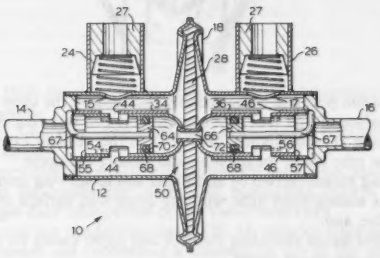
an earth-movement-responsive actuator connected to and displacing said member from its said position in response to a predetermined minimum severity earthquake, thus permitting opening of said valve.

4,094,333

REGULATING VALVE SYSTEM

Sigurdur G. Petursson, 2169 Linby Street, Mississauga, Ontario, Canada (L4Y 1V6)

Filed Apr. 14, 1976, Ser. No. 676,980
Int. Cl.² G05D *11/02*
U.S. Cl. 137—100 **7 Claims**



6. A pressure equalising valve having a pair of inlet chambers, each having an inlet to receive in operation a respective pressurized fluid supply in connected relation therewith, a pair of outlet chambers, and valve means interposed in flow regulating relation between each said inlet chamber and the respective outlet chamber for maintaining in predetermined relation the output pressure of two fluids supplied thereto, said valve means having a balancing valve mechanism comprising a slide valve means mounted in each said inlet chamber and supported in axially positioned pressure controlling relation by a diaphragm arranged in chamber dividing relation with said pair of outlet chambers, and substantially immoveable piston means within each said slide valve means blocking a cross section portion of each said slide valve means from exposure to the respective fluid inlet pressure, to provide a predetermined area of said valve means in pressure responsive axially unbalanced relation within the respective said inlet in direct axially facing relation with the respective said inlet chamber to assist in positioning said valve members in flow regulating relation.

4,094,334

OCEAN THERMAL ENERGY CONVERSION VALVE

Julian S. Taylor, 8300 SW. 8, Oklahoma City, Okla. 73108

Filed Jun. 23, 1977, Ser. No. 809,345
Int. Cl.² F16K *31/46*
U.S. Cl. 137—219 **6 Claims**

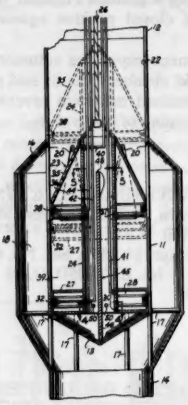
1. A tubular gate valve interposed between upper and lower sections of casing, said upper casing having a depending end, comprising:

a tube having a closed depending end and having an upper end at least diametrically equal with and coaxially connected with the depending end of said upper casing,

said tube having a plurality of ports in its wall spaced above its closed end;

tubular means connecting said tube with said lower casing for fluid communication therebetween through the tube ports;

sleeve valve means including a sleeve within said tube and upper and lower hollow ring members surrounding and secured to said sleeve in vertically spaced relation for forming upper and lower floatation chambers each having



a drain port and being slidably received by the inner wall surface of said tube, the spacing between said ring means being at least slightly greater than the vertical extent of the tube ports, for opening and closing the ports;

sealing means carried by said upper and lower ring members for sealing fluid tight with the inner wall surface of said tube; and,

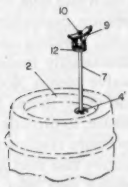
control means extending through said upper casing for moving said sleeve means.

4,094,335

BEER TAP ROD RETAINER

William C. Haensch, 2163 Arapahoe St., Denver, Colo. 80205

Filed Oct. 18, 1976, Ser. No. 733,161
Int. Cl. F16k *43/00*
U.S. Cl. 137—317 **8 Claims**



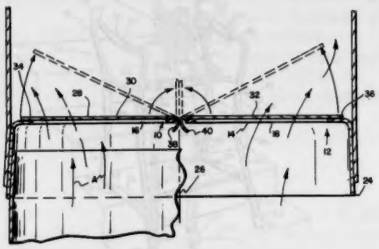
1. A beer tap rod and tap retainer bracket for mounting on a hollow tap rod having a tubular tap affixed to the upper end thereof and wherein said tap rod is insertable through a corked tapping hole therein, said bracket including a lower clamping ring for receiving the tap rod, said ring being clamped to said keg tapping hole, substantially flat and centrally apertured plate means spaced above said clamping ring for receiving said tap rod, and spaced arm means pivoted to and interconnecting said ring and plate means for relative pivotal movement therebetween whereby said tap is arranged therebetween and said tap extends through both said ring and plate means and is secured to the keg and prevented from being dislodged therefrom, and said arms and plate means are pivotal to permit of the installation of said tap through the clamping ring thereof.

4,094,336

BACK DRAFT FOR EXHAUST FANS AND HOODS

John N. Urschel, 3102 N. 46th Pl., Phoenix, Ariz. 85034; Robert P. Urschel, 727 Solano Dr., Tempe, Ariz. 85281, and Fred P. Urschel, 5302 N. Woodmere Fwy., Scottsdale, Ariz. 85253

Filed Apr. 19, 1977, Ser. No. 788,807
Int. Cl.² F16K *15/03*
U.S. Cl. 137—512.1 **12 Claims**



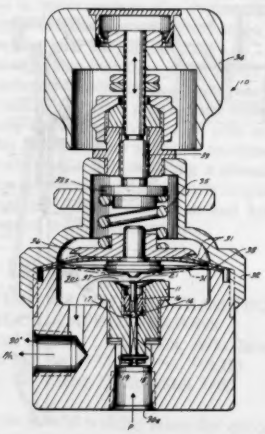
1. A back draft damper for exhaust fans and hoods comprising: a generally stationary valve plate having a pair of openings therein; said plate having a bar portion extending across said plate between said openings; said bar portion having an elongate slot therein; said slot having opposite sides; a pair of flapper valve plates having curved edge portions disposed in said slot; said flapper valve plates having overlapping portions while overlap the extremeties of respective ones of said openings; said flapper valve plates, at said curved edge portions, being freely pivotally moveable in said slot.

4,094,337

PRESSURE REGULATOR VALVE

Alfred D. Robinson, El Monte, Calif., assignor to Delphi Instruments, Inc., South El Monte, Calif.

Continuation-in-part of Ser. No. 516,024, Oct. 18, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,668
Int. Cl.² F16K *31/12*
U.S. Cl. 137—505.42 **4 Claims**



1. A water pressure regulator comprising

a body having a water inlet passageway, a water outlet chamber communicating with the inlet passageway and a water outlet passageway for conveying the water entering the inlet passageway out of the outlet chamber through the water outlet passageway,

water valve control means secured in the water inlet passageway for controlling the volume of water flow into the outlet chamber,

manually controllable means secured to the body for controlling the water valve control means to thereby control the quantity of water flow into the outlet chamber for controlling the output pressure of the water exiting from the outlet chamber, the manual means being adjusted for normally maintaining a preselected maximum pressure of water flow out the outlet chamber,

said water valve control means including a valve body having a stepped bore extending therethrough,

a sapphire ring mounted in the larger bore of the valve body,

means secured to the stepped bore for securing said ring against the inner wall of the bore, said means having a longitudinal passageway coaxial with the stepped bore for passing water therethrough,

a sapphire ball mounted on the opposite side of the inner wall of the bore and engaging the ring for coaction therewith,

means mounted in the bore for resiliently urging the sapphire ball against the sapphire ring, and

means mounted in the bore and extending through said longitudinal passageway of the securing means for urging the ball away from the ring, said means for urging the ball away from the ring includes an element that engages the ball that is constructed of sapphire,

the water to be sampled flows into the water pressure regulator through the valve body from the ball side of the bore, past the ball and through said longitudinal passageway and the bore into the outlet chamber and out through the outlet passageway,

said manual adjustable means including diaphragm means positioned in the water outlet chamber for responding to the pressure build-up in the outlet chamber and the changes in pressure for automatically responding thereto for varying the initial adjustment thereof for causing said water valve control means to respond to the changes in the adjustment of the diaphragm means to cause the water valve control means to automatically adjust for maintaining the water pressure downstream of the water pressure regulator essentially constant.

4,094,338

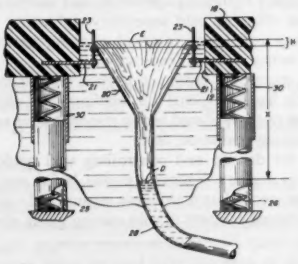
CONSTANT RATE FLOAT INTAKE

William J. Bauer, 422 S. Park Rd., LaGrange, Ill. 60525

Filed May 20, 1977, Ser. No. 798,988

Int. Cl.² G01F *11/00*; E03B *11/00*

U.S. Cl. 137—578 **7 Claims**



1. Liquid flow control apparatus for use in a reservoir of liquid of fluctuating level comprising a buoyant float member, an intake weir element carried by said float member, a conduit having one end thereof communicating with said weir element and extending downward therefrom to conduct flow by gravity of liquid from the weir, said conduit being yieldable to accommodate movement of said weir and float member, and counterbalancing springs which counterbalance the change in buoyancy as the buoyant float member and connected conduit rise and fall with the variable elevation of the liquid in which disposed.

4,094,339

HIGH TEMPERATURE COMBUSTION SHOCK DEBURRING SYSTEM

Ernst Leisner, Gerlingen; Wolfgang Ulbricht, Tamm, and Helmut Kaufmann, Bischberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

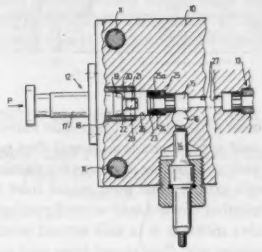
Division of Ser. No. 579,118, May 19, 1975, Pat. No. 4,015,815.

This application Dec. 6, 1976, Ser. No. 747,490

Claims priority, application Germany, May 17, 1974, 2424148

Int. Cl.² F16K *19/00*

U.S. Cl. 137—604 **6 Claims**



1. High-temperature combustion shock deburring system comprising

two deburring valve units (12, 13) having gas duct inlets and outlets,

means defining a mixing chamber (15) having gas duct inlets;

first gas conducting means (32) conducting oxygen to the gas duct inlet of one of the valve units (12);

second gas conducting means (28, 32) separate from said first means and conducting a combustion gas to the gas duct inlet of the other of the valve units (13);

and separate connecting lines (27) connecting the gas duct outlets of each of said deburring valve units (12, 13) to the gas duct inlets of said mixing chamber (15),

said deburring valve units, during deburring operation being closed and while in closed condition, being subjected to thermal and pressure shock,

at least one of said connecting lines (27)

being characterized in that

said one line (27) has a length of such extent that the line encloses therein a volume of the respective gas when placed under pressure due to an explosion in the chamber (15), so that the gas will compress and extend in the respective connecting line (27) for a distance from the respective valve unit (13) sufficient to thermally isolate the respective valve unit from the chamber and provide a compressible thermally isolating shock cushion for the respective valve unit and thus protect the respective valve unit against thermal damage and shock.

4,094,340

RELAY LOCK-OUT

Ned A. Bergeron, Houma, La., assignor to B.W.B. Controls, Inc., Houma, La.

Filed Dec. 13, 1976, Ser. No. 749,745

Int. Cl.² F16K *17/00*

U.S. Cl. 137—625.66 **3 Claims**

1. A device for controlling a first fluid signal from an actuator fluid supply to an actuator as a function of a further fluid signal received from a further fluid supply, comprising:

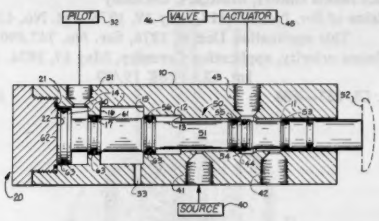
an axially bored housing;

said housing including further fluid signal inlet means communicating with said further fluid supply, first fluid signal

outlet means communicating with said actuator, and first fluid signal inlet means;

slide valve member movable within said housing bore from a first position allowing communication between said actuator fluid supply and said actuator, to a second position blocking communication between said actuator fluid supply and said actuator; and

means preventing a fluid signal through said further fluid



signal inlet means from causing said slide valve member to move from said second position to said first position, said preventing means including a) means for causing said fluid signal through said further fluid signal inlet to bias said slide valve member toward said second position whenever said slide valve member is in said second position, and b) means for causing said fluid signal from said actuator fluid supply to bias said slide valve member toward said second position at all times.

4,094,341

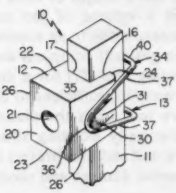
LOOM PICKER CONSTRUCTION

William T. Wagner, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Jun. 22, 1977, Ser. No. 809,131

Int. Cl.[2] D03D *49/36*

U.S. Cl. 139—159 **18 Claims**



1. In a loom picker construction having a picker stick, a shuttle-engaging block, and means holding said block on said stick; the improvement in said holding means comprising, a pair of projections extending from opposite sides of said block, and a spring clamp engaging said projections and stick and yieldingly urging said block against said stick, said spring clamp comprising a pair of similar roughly V-shaped portions each defined by a bight and a pair of diverging legs and each being disposed with its bight and legs in a common plane, with a pair of planes associated with the V-shaped portions being disposed in spaced approximately parallel relation and with the V-shaped portions symmetrically arranged.

4,094,342

AUTOMATIC BINDER

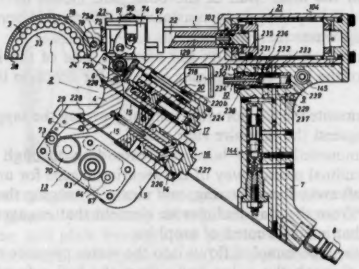
Mitsuo Nishikawa; Hideo Hosaka, and Jun Maemori, all of Takasaki, Japan, assignors to Max Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1977, Ser. No. 770,898

Claims priority, application Japan, Feb. 23, 1976, 51-17984; Mar. 6, 1976, 51-24438; Mar. 12, 1976, 51-26039; Mar. 12, 1976, 51-28596[U]; Mar. 13, 1976, 51-27266; Mar. 12, 1976, 51-26040; May 20, 1976, 51-58300; May 20, 1976, 51-63382[U]; Jun. 5, 1976, 51-65788; Oct. 28, 1976, 51-144078[U]; Nov. 4, 1976, 51-131637; Dec. 18, 1976, 51-152601; Feb. 21, 1976, 51-18328

Int. Cl.[2] B21F *9/02*

U.S. Cl. 140—93.2 **17 Claims**



1. An automatic binder for binding an object with a continuous flexible lacing material, comprising:

a main body;

guide means within said body for guiding said lacing material around the object to be bound, comprising mating guide elements, defining a central opening therewithin in a closed position of said mating guide elements, and being provided with lacing material lead-in and lead-out holes, said holes being connected with a continuous guide channel having the configuration of a knot;

feed-in primary tightening means for feeding said lacing material into said guide channel and rewinding said lacing material on said object to be bound to form a knot in a primary tightening operation;

lacing material gripping means actuated by a free end of said lacing material for gripping said free end of said lacing material during primary and secondary tightening operations, said means generating a first pilot signal for actuating said feed-in primary tightening means to effect said primary tightening operation and a second pilot signal for actuating a secondary tightening means to effect said secondary tightening operation; said secondary tightening means effecting said secondary tightening operation by moving said lacing material gripping means away from said lacing material lead-out hole;

cutting means for cutting a portion of said lacing material which has been used for binding said object from the excess portion of said lacing material after said secondary tightening operation; and

means for driving and controlling said guide means, said feed-in primary tightening means, lacing material gripping means, secondary tightening means, and cutting means in said closed position of said mating guide elements.

4,094,343

SLIDING COVER FOR DUPLICATING FLUID RECEPTACLES

Peter Koreska, Vienna, Austria, assignor to Kores Holding Zug AG, Zug, Switzerland

Filed Jan. 24, 1977, Ser. No. 761,678

Claims priority, application Austria, Feb. 4, 1976, 765/76

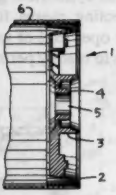
Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—86 **3 Claims**

1. In a sliding cover, for use in connection with a duplicating

fluid canister of a duplicating machine and including outlet means for discharging the fluid into a duct for distribution in the duplicating machine;

said outlet means comprising a raised lip forming a discharge opening and being operative to form an interconnection with the duct; and



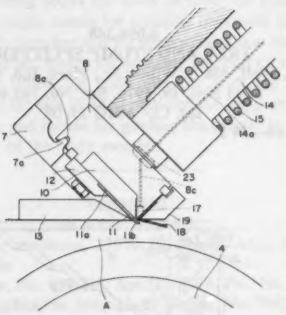
a collar formed by a tapering wall thereby defining an outwardly flaring funnel, said collar circumferentially surrounding and being spaced apart from said raised lip defining with said lip a reservoir for retaining duplicating fluid which may have leaked from the interconnection whereby any duplicating fluid leaked into said reservoir is easily removable therefrom.

4,094,344

APPARATUS FOR MENDING SURFACE IRREGULARITIES OF WOODEN PLATES

Katsuji Hasegawa, Nagoya, Japan, assignor to Meinan Machinery Works, Inc., Ohbu, Japan

Filed Aug. 17, 1976, Ser. No. 715,010
Int. Cl.[2] B65B *3/26*
U.S. Cl. 141—125 **9 Claims**



1. An apparatus for mending surface irregularities of a wooden plate which is fed past the apparatus in a selected direction along a predetermined path, said apparatus comprising:

support means;

head means mounted on said support means in an angled relationship with respect to said path, and cooperating means between said head and support means for permitting slight angular movement of said head means, said head means being located over the path of said wooden plate and having a putty outlet formed in the lower portion thereof, said head means also having passageway means provided therein for communication with said outlet;

supply means connected to said passageway means for supplying pressurized putty to said outlet;

a plurality of elongated needles positioned closely adjacent each other, said needles being disposed in a slanted relationship with respect to the wooden plate and having the upper portions thereof mounted on the lower portion of said head means, the lower portions of said needles being positioned adjacent said outlet and disposed for engagement with said wooden plate as it moves along said path whereby said wooden plate holds said lower portions of the needles in an upper position wherein they close said outlet, means causing said lower portions of the needles to be normally resiliently urged downwardly away from said head means and away from said outlet whereby they will move downwardly into any recesses or other surface irregularities in the wooden plate so as to at least partially open said outlet, the lower portions of said needles extending transversely above the path of said wooden plate;

pressing means acting against said head means for causing pivotal movement of said head means in a direction causing said lower portions of the needles to be moved downwardly toward the path; and

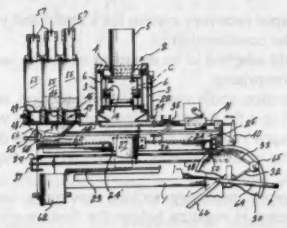
stop means positioned for engagement with the needles for limiting the downward movement of the lower portions of said needles away from said head means.

4,094,345

DISPENSING MACHINE TO PREPARE CUPS WITH A DRY CONTENT

Marcel Deziel, 3365 Petit St., St. Hubert, Canada

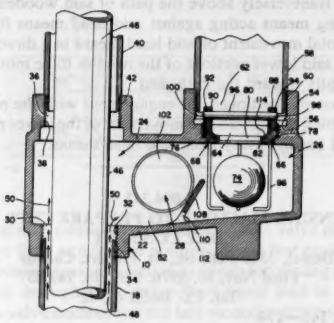
Filed Nov. 16, 1976, Ser. No. 742,257
Int. Cl.[2] B65B *43/42*
U.S. Cl. 141—174 **8 Claims**



1. In a machine to pour a dry granular or powdered ingredient into cups, the combination comprising a frame, an empty cup magazine carried by said frame for supporting a stack of nestled empty cups, a cup-releasing mechansim mounted at the lower end of said empty cup magazine for releasing the bottomost cup of said stack of empty cups, a cup-conveying mechanism mounted on said frame underneath said cup-releasing mechanism for receiving a cup released by said cup-releasing mechanism and conveying said cup along a path to a position at a dry ingredient dispensing station, a dry ingredient dispensing mechanism carried by said frame above and including a funnel having a bottom outlet in register with a cup positioned at said dispensing station, and a tripping elongated trough having a pouring end and pivoted about an axis transverse to the length of said trough and located away from said pouring end, said trough having an elongated projection extending underneath the same and along the same, being connected to said trough away from said pouring end to define a slot between the bottom of said trough and said projection, said projection having a free end disposed short of said pouring end, said trough biased to take a normal position closing said funnel bottom outlet, and having its pouring end disposed just above a cup being conveyed to said ingredient dispensing station and with said projection having its free end in the path of said last-named cup, said last-named cup, during its terminal movement towards said station, abutting against said free end of said projection and causing downward pivoting of said trough to an open discharging position to cause said trough pouring end to engage over and into said cup as said cup reaches said station while uncovering said funnel bottom outlet to allow pouring of the ingredient from said funnel into said

cup, the top portion of the cup wall progressively engaging said slot during downward pivoting of said trough.

4,094,346
TANK MANIFOLD
Joseph V. Milo, Elizabeth, N.J., assignor to Universal Valve Co., Inc., Elizabeth, N.J.
Filed Aug. 12, 1976, Ser. No. 713,641
Int. Cl.[2] B65B *3/18*; F16K *1/14*
U.S. Cl. 141—286 **2 Claims**



1. In a vapor recovery system for a liquid and vapor containing tank, the combination of

a manifold adapted to be mounted upon the tank, said manifold comprising

a fill section and a vapor recovery section, said fill section having a fill opening in communication with the tank,

said vapor recovery section having a boss defining a first vapor return opening for recovering vapor from the tank,

said vapor recovery section having a smaller bottom opening in registry below the first vapor return opening, said first and second openings being in communication and defining a vapor channel through which the vapor to be recovered passes;

means to admit vapor from the tank into the manifold through the fill opening;

float means mounted in the vapor recovery section at the said second opening to prevent liquid from exiting the manifold through the vapor return opening,

the said float means being of size and configuration to upwardly pass through the first opening to permit remote removal from above;

an inclined baffle affixed interiorly at the manifold intermediate the float means and the fill section; and

wherein the manifold comprises a floor which slopes downwardly from the vapor recovery section towards the fill section, the baffle being secured to the floor and being provided with a drain opening, said opening permitting the passage of liquid along the floor from the vapor recovery section to the fill section and thence back to the tank.

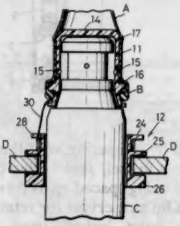
4,094,347
BALLOON NECK FITTING
Kikuji Ikemoto, 100-27, Shin-narita, Hirono-cho, Uji-shi, Kyoto, Japan
Filed Dec. 23, 1976, Ser. No. 753,944
Claims priority, application Japan, Jul. 10, 1976, 51-135307
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—313 **6 Claims**

1. A balloon neck fitting, for use in a balloon vending machine having a transporting mechanism to transport the balloons therethrough and a gas supply nozzle to fill the balloon with gas, comprising:

a. a cylindrical check valve section having a configuration adapted to be fitted in the neck of a balloon, and being closed at the one end to be inserted into the neck of the balloon and open at the other end, and having several openings in the lateral wall thereof;

b. guide means for engaging the transporting mechanism of the balloon vending machine, said guide means comprising an open-ended cylindrical guide section;

c. frangible connecting means for connecting said guide section with the open end of said check valve section in such a manner as to readily permit breaking of the connection;

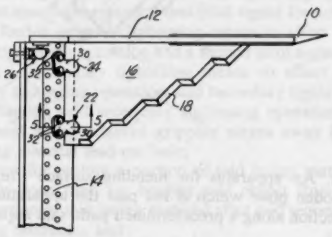


d. a string connected at one end to said check valve section, and connected at the other end to said guide section; and

e. said open ended cylindrical guide section and said check valve section open end being sized to receive therein the gas supply nozzle of the balloon vending machine,

whereby, after the balloon is filled with gas by means of the gas supply nozzle, said frangible connecting means is caused to be broken, leaving said sections connected only by said string.

4,094,348
TREE AND STUMP SPLITTER
Robert H. Wolf, 408 S. Willow St., Flora, Ind. 46929
Filed Nov. 19, 1976, Ser. No. 743,487
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—34 F **4 Claims**

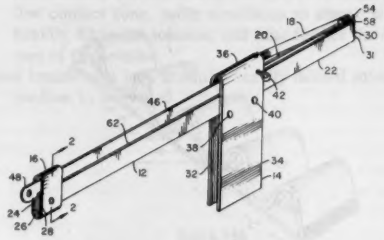


1. A stump splitter attachment for a bulldozer having a bulldozer blade, said attachment comprising a vertical sharp edged stump splitting blade extending forwardly of said attachment, at least one horizontally extending generally triangular cut off blade secured to said splitting blade from a position near the forward end of said splitting blade and having a rear edge lying in a plane normal to said splitting blade, and means to secure said attachment to the bulldozer blade in which said means to secure said attachment to the bulldozer blade consists of at least three ball means disposed in a triangular configuration secured to said attachment, socket means swingably mounted on said balls said socket means being provided with flanges including holes to receive bolts by which said socket means may be secured to the bulldozer blade.

4,094,349
HAND SABRE SAW

William C. Lajack, and Joseph J. Lajack, both of 3446 Berkshire, Warren, Mich. 48091

Filed Mar. 3, 1977, Ser. No. 773,927
Int. Cl.[2] B27B *21/00*
U.S. Cl. 145—31 B 9 Claims

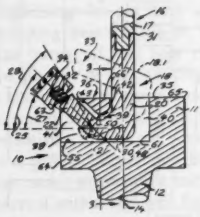


1. A saw including an elongated, U-shaped body member constructed of an elongated metal band folded centrally to provide a short connecting portion and two elongated leg portions defining a slot capable of receiving a saw blade therebetween, which leg portions extend longitudinally of the body member with the connecting portion at one end of the body member, a handle constructed of an elongated U-shaped metal band folded centrally to provide a connecting portion and two elongated leg portions positioned over the body member with the leg portions of the handle immediately adjacent and outside of the leg portions of the body member and with the connecting portion above the body member, a collar constructed of a continuous metal band secured to the other end of the body member extending above the body member for guiding a saw blade therethrough, means for securing the collar to the other end of the body member and for supporting a saw blade guided through the collar, means for securing one end of a saw blade to the handle above the body member with the saw blade extending into the slot defined between the leg portions of the body member, and means for guiding the handle in movement longitudinally of the body member.

4,094,350
SCREW DRIVER

Ralph Spencer Jacobson, 27970 Le Dunne Ave., Aldergrove, B.C., Canada

Division of Ser. No. 680,715, Apr. 27, 1976, Pat. No. 4,033,244.
This application May 12, 1977, Ser. No. 796,348
Int. Cl.[2] B25B *15/02*
U.S. Cl. 145—50 D 10 Claims



1. A screw engaging means of a screw driver, the screw engaging means being adapted to extend from a shank of the screw driver and being generally V-shaped and including a root portion, a transverse portion and an oblique portion, the portions being characterized by:

(a) the root portion extending from the screw driver shank to join the transverse portion,

(b) the transverse portion interconnecting the root and oblique portions, the transverse portion having a size sufficient to pass through a clearance passage extending under a bridge portion of a screw,

(c) the oblique portion extending obliquely from the transverse portion to an outer end of the oblique portion, the outer end having stop engaging means spaced from the transverse portion sufficiently to accept the screw retained on the transverse portion,

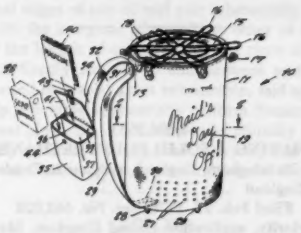
and the screw engaging means further includes:

(d) a separable stop member to engage releasably the stop engaging means at the outer end of the oblique portion to retain the screw on the screw driver.

4,094,351
LAUNDRY BAG

Frank Catenaccio, 222 Cayler St., Brooklyn, N.Y. 11222

Filed Oct. 5, 1976, Ser. No. 729,724
Int. Cl.[2] A45C *11/00*
U.S. Cl. 150—7 3 Claims



1. A laundry bag, comprising in combination, a canvas bag for containing laundry articles, a utility bag for containing a box of washing powder and magazines or related objects, and a shoulder strap secured to said canvas bag and utility bag for resting across a person's shoulder with said canvas bag at said person's back and said utility bag at a front, said canvas bag has a mouth at an upper end closable by a canvas lid hingedly stitched to said canvas bag, said lid having several looped ropes attached thereupon and extending radially with loops at an edge of said lid, said loops being engagable with rope knits around said bag upper end, said looped ropes together with other circular ropes attached on said lid having the nautical shape of a ship wheel.

4,094,352
FASTENERS HAVING TOOTHED BEARING SURFACES

Emil J. Hlinsky, Oak Brook, Ill., assignor to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

Continuation of Ser. No. 589,529, Jun. 23, 1975, abandoned.
This application Oct. 21, 1976, Ser. No. 734,680
Int. Cl.[2] F16B *39/28*
U.S. Cl. 151—37 18 Claims

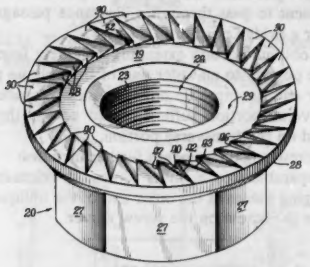
1. In a fastener for a threaded joint, a body having an end portion symmetrical about a central axis with a plurality of teeth in an annular array integrally formed in said end portion;

said teeth having individual top bearing surfaces comprising discontinuous sections of said end surface, said individual top bearing surfaces being flanked in opposite circumferential directions respectively by an abrupt side surface and a gradually sloping side surface;

whereby said top bearing surfaces limit the indentation of said teeth into the coacting surface of a workpiece in accordance with the combined areas of said top bearing surfaces;

said individual top bearing surfaces each having generally

the shape of a triangle with a base and an apex respectively at outer and inner margins of said annular array; and



the height of each abrupt side surface as measured parallel to said central axis progressively increasing from the base to the apex.

4,094,353

TIRES HAVING A SOLID POLYURETHANE CORE

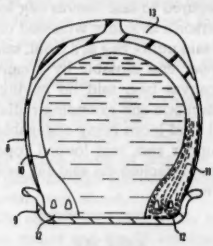
Peter Ford, Birmingham, England, assignor to Dunlop Limited, London, England

Filed Feb. 27, 1976, Ser. No. 662,020

Claims priority, application United Kingdom, Mar. 6, 1975, 9254/75

Int. Cl.[2] B60C *1/00*; C08G *18/14, 18/48, 18/76*

U.S. Cl. 152—310 **11 Claims**



1. A tire and wheel rim assembly comprising a tire having a reinforced carcass, a wheel rim on which the tire is mounted to define a chamber, the chamber having a filling of resilient solid polyurethane material consisting of the reaction product of a) at least one liquid polyoxpropylene polyether polyol and b) a diphenylmethane diisocyanate chemically modified by known means to liquid form, the amounts of these reactants being such that the ratio of functional isocyanate groups to hydroxyl groups is in the range 0.65 to 0.9.

9. A process for puncture-proofing a pneumatic tire mounted on a wheel rim comprises filling the tire with a liquid reactant mixture of (a) at least one liquid polyoxypropylene polyether polyol and (b) a diphenylmethane diisocyanate chemically modified by known means to liquid form the amounts of these reactants being such that the ratio of functional isocyanate groups to hydroxyl groups in the reactants is in the range 0.65 to 0.9, and cross-linking said mixture to form a resilient solid polyurethane material filling the tire.

4,094,354

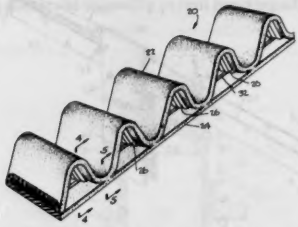
BREAKER REINFORCING TAPE FOR BELTED PNEUMATIC TIRES, AND TIRES MADE THEREFROM

Wesley Ferrell, Southbury, and Daniel Shichman, Trumbull, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,803

Int. Cl.[2] B60C *9/22*

U.S. Cl. 152—361 R **55 Claims**



21. An uncured belted pneumatic tire, comprising a carcass composed of at least one body ply, and a belt-forming structure surrounding said body ply in the medial region of said carcass, said belt-forming structure being constituted by a tape of cords wound substantially helically around said medial region of said carcass with a multiplicity of turns having a pitch of substantially zero degrees relative to the median equatorial or mid-circumferential plane of said carcass, and said tape comprising a crimped strip having continuous undulations, a plurality of said cords extending side by side in parallel relation longitudinally along said crimped strip, each of said cords having respective undulations corresponding to and nesting in the undulations of said crimped strip, first means for anchoring each of said cords to said crimped strip, a flat strip having a width substantially corresponding to the width of said crimped strip, second means for anchoring said flat strip to alternate ones of the apexes of the undulations of said crimped strip, and frangible means coextensive with said flat strip for releasably reinforcing and stabilizing said flat strip against inadvertent expansion that would prematurely reduce the amplitude and frequency of the undulations of said crimped strip and of said cords.

4,094,355

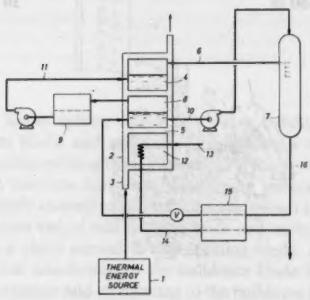
HEAT RECOVERY PROCESS

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 23, 1976, Ser. No. 725,759

Int. Cl.[2] F25B *15/00*

U.S. Cl. 165—1 **20 Claims**



1. A process for transferring thermal energy comprising contacting steam and a water absorbent solution in a first contact zone under conditions to absorb water, dilute the solution, and raise the temperature of the solution, the solution

being in indirect heat exchange with an aqueous stream and raising the temperature of the aqueous stream and converting at least the bulk of the aqueous stream to steam,

passing diluted solution from the first contact zone to a second contact zone,

passing the aqueous stream of raised temperature produced in the first contact zone to a second contact zone wherein the stream is contacted with the diluted solution from the first contact zone, under conditions to absorb water and heavily dilute the solution, and raise further the temperature of the solution,

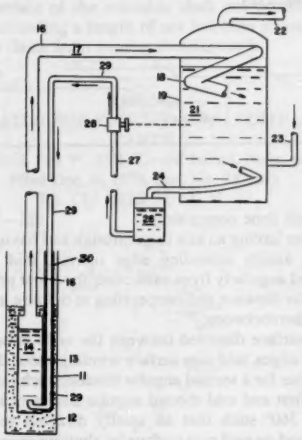
and transferring heat from the heavily diluted solution to a medium to be heated.

4,094,356

GEOTHERMAL HEAT RECOVERY SYSTEM

Whewell Frank Ash, 1095 Capital Hill, Reno, Nev. 89502, and Frank Robert Ash, 834 Shriver Blvd., Sparks, Nev. 89403

Filed Jan. 6, 1977, Ser. No. 757,379
Int. Cl.² F28D *15/00*
U.S. Cl. 165—39 **5 Claims**



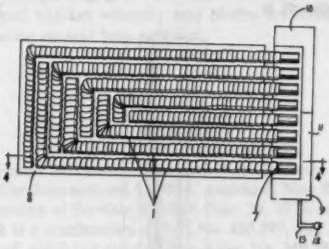
1. A geothermal heat recovery device, comprising a heat absorber containing a variable quantity of working fluid, said heat absorber being disposed within a hot zone of a geothermal well, a gas delivery pipe extending from said heat absorber out of said well, heat exchanger means connected to said gas delivery pipe for condensing the gas from said delivery pipe to liquid and conducting heat therefrom, reserve tank means connected to the output of said heat exchanger means for storing a reserve quantity of said working fluid, a supply pipe extending from said reserve tank means down said well to said heat absorber to supply said working fluid thereto, said supply pipe being substantially full of said working fluid in liquid phase to create a substantial pressure head in said heat absorber, insulation means surrounding said supply pipe for the entire portion thereof within said well for limiting the heating and expansion of and preventing vaporization of said working fluid within said supply pipe, and thermostatic valve means including a sensing element operatively associated with the operating temperature of said heat means interposed between said reserve tank means and said supply pipe for selectively controlling the feed rate of said working fluid to said heat absorber.

4,094,357

HEAT TRANSFER BLANKET

Ronald Sgroi, Syosset, N.Y., assignor to Kenneth C. McCord, Bethpage, N.Y.

Filed Apr. 9, 1976, Ser. No. 675,301
Int. Cl.² F28D *15/00*; A47C *19/00*; H05B *1/00*
U.S. Cl. 165—105 **5 Claims**



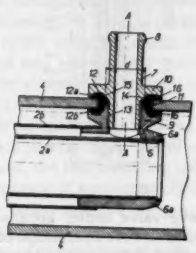
1. A heat transfer blanket comprising a plurality of flexible sheath heat pipes, a pair of juxtaposed fabriclike layers having the marginal edges of one of said pair substantially in intimate contact with the marginal edges of the other of said pair, a portion of the length of each of said heat pipes adjacent one end thereof fixedly secured to and between said fabric-like layers disposed in spaced apart relationship, said spaced apart relationship providing substantially uniform distances between adjacent heat pipes, the other end of said plurality of said heat pipes fixedly secured to a solid metallic rod, said rod in intimate thermal contact with a source of thermal energy.

4,094,358

LIQUID COOLING APPARATUS

René Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Mar. 29, 1976, Ser. No. 672,546
Claims priority, application France, Apr. 2, 1975, 75 10251
Int. Cl.² F28D *7/12*
U.S. Cl. 165—154 **7 Claims**



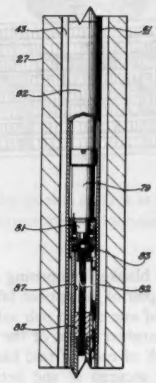
1. Apparatus for cooling liquid, such as oil, including an exchanger disposed within a container having a wall and being filled with a cooling medium, such as water, said wall having passages therethrough, fluid connectors fixed to said exchanger for the inflow and outflow of the liquid to be cooled and extending through the passages in said container wall, each connector comprising two parts, each part extending through said container wall from opposite sides thereof, one part penetrating the other part, said two parts, when assembled together, forming an annular cavity closed on at least one side of said container wall and enclosing the rim of the passage associated therewith and an annular seal arranged in said cavity astride the rim of said passage and substantially filling said cavity, the volume of said cavity gradually diminishing and compressing said seal during assembly of said two parts.

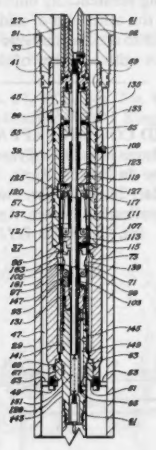
4,094,359

APPARATUS AND METHODS FOR TESTING EARTH FORMATIONS

David W. King, Fort Worth, Tex., assignor to Gearhart-Owen Industries, Inc., Fort Worth, Tex. and Petro-Data C. A., Caracas, Venezuela

Filed May 27, 1977, Ser. No. 800,902
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—65 R **3 Claims**





1. Motorized sleeve valve shifter apparatus for use in a wireline tool in earth well bore operations, comprising:

a. a drive shaft extending longitudinally within the body of said wireline tool and powered by an electric motor for controlled reciprocating movement;

b. upwardly facing lower latch dog means pivotally fixed to the body of said wireline tool and adapted, when extended, to engage shoulder means to prevent movement of said wireline tool in the upward direction;

i. first spring means for biasing said latch dog means outwardly;

ii. means on said drive shaft for compressing said first spring means to retract said latch dogs when said drive shaft is in a lowermost position and permitting extension of said latch dogs when said drive shaft has moved upwardly to an intermediate position;

c. upwardly facing latch arm means pivotally fixed at the lower end to a first slidable collar means that is in turn fixed by first shear pin means to said drive shaft, said latch arm means adapted, when extended, to engage shoulder means on said sleeve valve means so that said sleeve valve means may be actuated and controlled by movement of said latch arm means;

i. link means pivotally connected at one end to the upper end of said latch arm means and at the other end to a second slidable collar means that is free to move relative to said drive shaft and said wireline tool body;

ii. stop means for limiting downward movement of said second slidable collar means such that when said drive shaft is in its lowermost position said latch arm means is retracted;

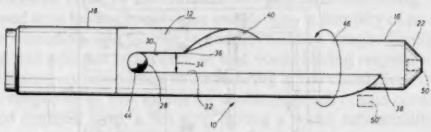
iii. second spring means for biasing said second slidable collar means downwardly so that, when said drive shaft is in said intermediate position, said sleeve valve means is in the open position and said latch arm means is at least partially extended; and, when said drive shaft is moved to its uppermost position, said sleeve valve means is moved by engagement of fully extended said latch arms to its closed position.

4,094,360

SELF-LOCKING MULE SHOE

Sharon Parr Nelson, Houston, Tex., assignor to Wilson Industries, Inc., Houston, Tex.

Filed Jul. 1, 1977, Ser. No. 812,062
Int. Cl.[2] E21B *41/00*
U.S. Cl. 166—243 **3 Claims**



1. A mule shoe comprising:

a member having an axis therethrough and having a long and short axially extending edge therein, said edges being spaced angularly from each other for a first predetermined angular distance and cooperating to define a key-receiving slot therebetween;

a cam surface disposed between the ends of said long and short edges, said cam surface winding about the axis of the member for a second angular distance such that the sum of said first and said second angular distances is equal to at least 360° such that an axially directed reaction force imposed on said cam surface by abutting engagement with a key imposes a torque on said member in a predetermined direction.

4,094,361

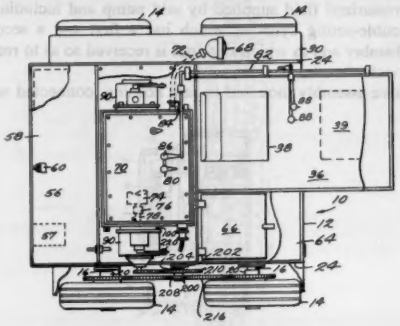
PERMISSIBLE MINE CAR ADAPTER ASSEMBLY

Jeffry R. Yago, Barboursville, W. Va., assignor to Lester Construction Company, Hurricane, W. Va.

Filed Apr. 20, 1976, Ser. No. 678,631
Int. Cl.[2] H02K *5/10*
U.S. Cl. 169—48 **3 Claims**

1. A fire-safe torque transmission apparatus comprising a walled explosion proof container, a sleeve member defining a throughgoing bore secured to a wall of said explosion proof container, the bore allowing communication of the interior of said container with the atmosphere, an adapter plate assembly removeably mounted to said sleeve member, said adapter plate assembly comprising a support member and a shaft support member connected to said support member, said shaft support member defining a throughgoing bore with first, second and third annular steps at each end, the third step forming a common step for both ends and defining a cylindrical bore adapted to receive a rotatable shaft, the first step serving as a bearing race seat and the second step serving as a flame baffle, ball-

bearing race means mounted on each end of said shaft support member in said bearing race seats, a rotatable shaft of smaller diameter than the diameter of the cylindrical bore formed by the common third step mounted on said ball-bearing race means and rotatably positioned within said cylindrical bore, one end of said shaft being connected to a motor mounted



inside said explosion proof container and being adapted to be rotated by said motor with the spacing between the inner wall of the shaft support member defining the cylindrical bore and the outer surface of the rotatable shaft not exceeding 0.014 inches and extending a length of not less than about 1½ inches to prevent a flame from passing therethrough.

4,094,362

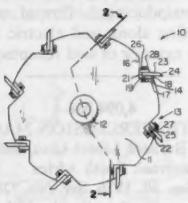
APPARATUS FOR FINE GRADING COMPACTED EARTH

Melvin O. Hild, 923 W. 15th, Grand Island, Nebr. 68801

Filed Dec. 6, 1976, Ser. No. 747,662

Int. Cl.² A01B *33/02, 33/10*

U.S. Cl. 172—120 **4 Claims**



1. Apparatus for fine grading compacted earth including a cutting blade, said blade comprising:

(a) a substantially planar circular base member having a hole through the center thereof and a plurality of 90° notches evenly spaced about the circumference of said base member, each notch including first and second legs which, in turn, are each perpendicular to the plane of a radius of said base member;

(b) a collar affixed to one side of said base member, said collar having a hole therethrough substantially the same size as said hole through said base member and aligned therewith, said collar further having fixing means thereon for decreasing at least partially the diameter of said hole through said collar;

(c) a slot in said first leg of each of said 90° notches;

(d) an L-shaped bracket having a threaded hole through the long leg thereof fixed to said first leg of each of said 90° notches such that said threaded hole is aligned with said slot and the short leg of the bracket is in contact with said second leg of said 90° notches;

(e) a rectangular blade having a sharpened edge positioned on each of said L-shaped brackets and projecting past the periphery of said base member, each of said blades having a hole therethrough aligned with said threaded hole in said L-shaped bracket;

(f) a substantially planar rectangular fixing plate positioned on each of said blades, each of said fixing plates having a hole therethrough aligned with said hole in said blade and said threaded hole in said L-shaped bracket; and

(g) a bolt projecting through each of said aligned holes and threadingly engaged with said threaded hole in said L-shaped bracket whereby said blades are fixedly held in position on said base member.

4,094,363

CULTIVATING IMPLEMENTS

John Michael McCoomb, Auckland, New Zealand, assignor to Spintiller International Limited, Auckland, New Zealand

Continuation of Ser. No. 633,949, Nov. 20, 1975, abandoned, which is a continuation of Ser. No. 485,597, Jul. 3, 1974, abandoned, which is a continuation of Ser. No. 340,747, Mar. 13, 1973, abandoned. This application Jul. 28, 1977, Ser. No. 819,994

Claims priority, application New Zealand, Mar. 13, 1972, 166562

Int. Cl.² A01B *21/04*

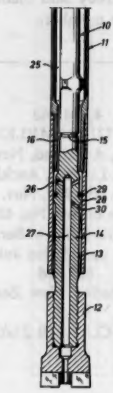
U.S. Cl. 172—349 **5 Claims**

1. A cultivating implement for cultivating the ground by movement thereover, said implement comprising a head member disposed so as to be movable over the ground; a pair of axles extending one on each side of said head member outwardly and at an included angle of substantially 160°, the axles in use lying substantially in a plane parallel to the ground; at least one tined spider means of diameter D freely rotatably mounted on each said axle about a center axis of the spider means, each spider means being unitarily and integrally formed and having a boss of diameter of approximately 0.23D and four or five cantilever mounted tines radiating from said boss each to a free end, each tine having a base of circular cross section adjoining said boss, the tine extending radially from said base to a plane at a distance of approximately 0.2D from the center axis of the spider means and then being arcuately curved along its remaining length curving forwardly in the direction of movement in use of the implement with a radius of approximately 0.3D from a center on a tangent to a circle of radius approximately 0.2D, said tangent being normal to the axis of the base of the tine, adjacent sides of adjacent tines curving smoothly into each other, the tines progressively reducing in cross-section from the boss to their free ends, the base of each tine having a diameter of approximately 0.2D where it adjoins the boss, a diameter of approximately 0.06D at said plane, thereafter the cross section of the tine becoming oval towards the free end of the tine and the tine terminating at said free end in a chisel-shaped cutting edge lying in a plane substantially parallel to the axle upon which the respective spider means is mounted; the progressive reduction in cross section of the tines resulting in any particular cross section of a tine having a perimeter length no greater than the perimeter length of another cross section of the tine which is closer to the boss than said particular cross section.

4,094,364
PERCUSSION DRILL ROD

Hans Per Olof Lundstrom, and Ernst Lennart Johansson, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Jun. 25, 1974, Ser. No. 483,045
Claims priority, application Switzerland, Jul. 5, 1973, 7309455
Int. Cl.[2] E21B *1/06*
U.S. Cl. 173—80 **1 Claim**



1. Drill rod structure for use with a percussive-type rock drilling machine comprising,

a plurality of rod members (**10**);

a plurality of tubular members (**11**) connected to each other, said tubular members being disposed around said rod members leaving a space (**25**) between them and said rod members;

a drill bit (**12**) having a shank (**14**) provided with a force-receiving surface;

said rod members being massive and loosely mounted in end abutment with each other to transmit only longitudinal forces to said drill bit;

said tubular members being rotatably connected to the drilling machine at one end portion and having a slideable interlocking connection (**13**) with said shank at the opposite end portion to transmit only rotational forces to said bit shank;

said bit shank also having means (**28**) to prevent said shank and bit from sliding out of said tubular members;

either of said rod and tubular members being provided with protrusions (**21**) extending in several directions to function as guides and to provide passageway for flushing medium to pass through said space and thereby also to pass between said protrusions, said slideable interlocking connection consisting of splines connecting said bit shank with the foremost tubular member, said bit shank being provided with a centrally extending flushing channel (**27**) and at least one channel (**26**) extending laterally at an acute angle from and in communication with said first channel and with the aforesaid space.

4,094,365
ELECTROHYDRAULICALLY OPERATED PORTABLE POWER TOOL

Karl Wanner, Echterdingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 574,715, May 5, 1975, Pat. No. 3,995,703. This application Aug. 6, 1976, Ser. No. 712,247
Claims priority, application Germany, May 20, 1974, 2424391
Int. Cl.[2] B25D *11/00, 9/00*
U.S. Cl. 173—117 **2 Claims**

1. A portable power tool, particularly an impact type power tool, comprising a hollow housing;

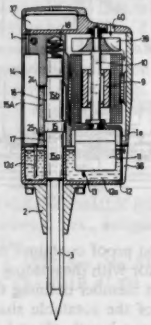
holder means carried by said housing and arranged to receive a tool adapted to reciprocate with respect thereto;

a hydraulic pump mounted in said housing;

a receptacle provided in said housing and arranged to contain a supply of hydraulic fluid for said pump;

hydraulic motor means mounted in said housing, driven by pressurized fluid supplied by said pump and including a double-acting cylinder which has a first and a second chamber and in which said tool is received so as to reciprocate therein;

a valve assembly mounted in said housing, connected with



said pump and operative to alternately admit pressurized fluid into said first and second chambers and to thereby effect reciprocation of said tool;

means for cooling the supply of hydraulic fluid in said receptacle including blower means mounted in said housing; and

an electric motor mounted in said housing and arranged to drive said hydraulic pump and said blower means, said blower means being arranged for sucking air into said housing and then inducing the flow of sucked air from said blower means first along said electric motor and thereupon along the exterior of said receptacle.

4,094,366
PNEUMATIC PERCUSSION MACHINES

Abraham Glen, and Bernard Lionel Glen, both of PO Box 196, Swartruggens, Transvaal, South Africa

Filed Sep. 30, 1976, Ser. No. 728,027
Claims priority, application South Africa, Oct. 2, 1975, 75/6257
Int. Cl.[2] H01B *17/00*
U.S. Cl. 173—138 **5 Claims**

1. A pneumatic percussion machine including:

a hollow casing;

a valve assembly at one end of the casing;

a bit assembly at the other end of the casing;

a piston for reciprocation in the casing between a first position in which it is in contact with the bit assembly and a second position in which it is removed from such first position, the piston being stepped along its length;

a first chamber formed between an end of the piston and the valve assembly;

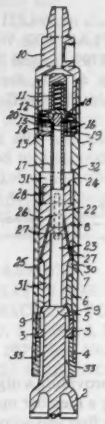
a second chamber formed inwardly from the other end of the piston about such stepped portion of the piston;

a first fluid supply path through the valve assembly to the first chamber;

a second fluid supply path through the valve assembly to the second chamber, such second fluid supply path passing, for at least part of its length through the piston;

a first fluid discharge path from the first chamber passing between the wall of the casing and the piston and then through the piston, such fluid discharge path being open

in particular positions of the piston along the length of the hollow casing;



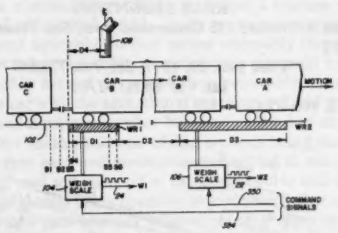
the arrangement being one in which the valve assembly is adapted, on operation of the machine, to open alternately the fluid supply paths.

4,094,367

SYSTEM FOR SINGLE DRAFT WEIGHING OF CARS COUPLED IN MOTION

William F. Jones, Glenview, and Gerald J. Hochberger, Chicago, both of Ill., assignors to Railweight, Inc., Elk Grove Village, Ill.

Filed Feb. 16, 1977, Ser. No. 769,032
Int. Cl.² G01G *19/04*
U.S. Cl. 177—1 **27 Claims**



1. A method for weighing railroad cars coupled in motion, each of which railroad cars has a front truck and a rear truck, comprising the steps of:

(a) providing a first scale and a second scale located forwardof said first scale;

(b) moving said railroad cars over said first and second scales;

(c) weighing the rear trucks on said first scale and storing said weight;

(d) while the rear truck of a railroad car under consideration is on said first scale, weighing on said second scale the front truck of the railroad car under consideration and the rear truck of the just preceding railroad car;

(e) totaling the weights on the first and second scales; and

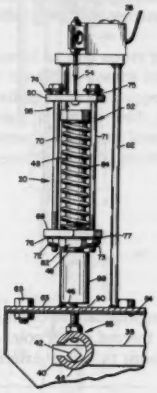
(f) subtracting the stored weight of the rear truck of the just preceding railroad car to obtain the full draft weight of the railroad car under consideration.

4,094,368

LOAD CELL OVERLOAD PROTECTION SYSTEM FOR WEIGHING SCALES

Robert I. Sann, Englewood Cliffs, and Arthur Goldberg, Fort Lee, both of N.J., assignors to Howe Richardson Scale Company, Clifton, N.J.

Filed Feb. 3, 1976, Ser. No. 654,752
Int. Cl.² G01G *21/10*
U.S. Cl. 177—128 **25 Claims**



1. In a weighing scale, a load-receiving structure for receiving a load to be weighed, force-transmitting means supporting said load-receiving structure for transmitting a load-induced force resulting from application of a load to said load receiving structure, and a self-contained module comprising a rigid support structure and an assembly supported by said support structure and detachably connected to said force-transmitting means, said assembly comprising a load cell receiving said load-induced force for converting said load-induced force into a weight-indicating signal other than a mechanical force, a preloaded spring in series with said load cell and biased to protect said load cell from overload, and means enabling selective preloading of said spring to set a selected preload force in said spring independently of any scale parts not forming a part of said module and without requiring assembly of said module with any other scale parts, said load cell being stationarily and rigidly mounted on said rigid support structure so that it remains stationary relative to said support structure while preloading said spring.

4,094,369

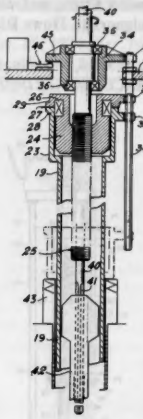
MONITORING DEVICE FOR NUCLEAR REACTOR CONTROL RODS

Raymond Blanc, and Roland Jacquelin, both of Manosque, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 7, 1975, Ser. No. 620,416
Claims priority, application France, Oct. 8, 1974, 74 33852
Int. Cl.² G01G *19/14, 3/14;* G21C *17/10*
U.S. Cl. 177—147 **9 Claims**

1. A monitoring device for nuclear reactor control rods including an assembly for the continuous weighing of a control rod and at least the moving portion of a rod-position control mechanism, comprising at least one strain gage and a circuit for said strain gage for measuring the electrical resistance of said gage which resistance varies with elongation of said strain gage, said elongation being a function of the weight to be measured, a drive mechanism of the screw-and-nut type for said control rod, said mechanism being carried on a fixed reference plane by a supporting head applied against beams inset at a stationary extremity with respect to said reference plane, said mechanism being subjected to bending stress under

the action of the weight of said control rod and said drive mechanism, at least one strain gage for each of said beams



extending in the longitudinal direction of said beam between the inset extremity thereof and a point of application of said supporting head against the other extremity of said beam.

4,094,370

VESSEL FOR WEIGHING MATERIALS

Johannes Petrus Ruiter, Bemmel (Gld), Netherlands, assignor to Stichting Energieonderzoek Centrum Nederland, The Hague, Netherlands

Filed Jul. 21, 1976, Ser. No. 707,257

Claims priority, application Netherlands, Aug. 26, 1975, 7510033

Int. Cl.² G01G *23/14, 3/18*

U.S. Cl. 177—168 **5 Claims**

1. In apparatus for weighing and handling a fluid material of the kind including a weighing vessel, a measuring beam fixed at spaced positions against downward movement and suspending said vessel between said positions so that said measuring beam is deformed by the weight of said vessel, a measuring member associated with said measuring beam for measuring the deformation of the latter and hence for indicating the weight of said vessel, and a material supply line for supplying fluid material to said vessel, the improvement wherein said supply line has at one end a resilient conduit-portion adapted to be elastically deformed, said conduit-portion being in communication with said weighing vessel for the flow of fluid material, and the conduit-portion at its other end being connected to an adjustable suspension point on a fixed base and being subjected to a prestressing force by means for adjusting the suspension point so that the required prestress is obtained such that the change in this prestressing force due to the change with the working temperature of the elasticity modulus of the conduit corresponds to the opposite change in the elastic force of the conduit resulting from its thermal change in length.

4,094,371

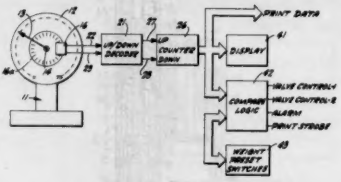
DIGITAL DISPLAY FOR WEIGHING SCALES

Herbert W. Ferrell, 38799 Jonquil Dr., Newark, Calif. 94560

Filed Feb. 4, 1976, Ser. No. 655,014

Int. Cl.² G01G *23/37*

U.S. Cl. 177—210 R **1 Claim**



1. In apparatus for providing a digital signal indicative of the load on a scale having a member operatively connected to the member for providing first and second electrical signals which change from a first level to a second level and return to the first level each time the member moves a predetermined amount, the first signal leading the second signal when the member moves in a first direction and the second signal leading the first signal when the member moves in a second direction, a first pair of cascaded flip-flops to which the first signal is applied, a second pair of cascaded flip-flops, a first exclusive OR gate connected to the outputs of the flip-flops in the first pair, a second exclusive OR gate connected to the outputs of the flip-flops in the second pair, up/down counting means, and multiplexing means responsive to the outputs of the flip-flops for delivering pulses from the OR gates to the counting means to be counted in a direction corresponding to the direction in which the displaced member moves.

4,094,372

MOTORIZED SKATEBOARD WITH UNI-DIRECTIONAL REAR MOUNTING

Michael A. Notter, 115 Greenwood Ave., San Francisco, Calif. 94112

Filed Feb. 28, 1977, Ser. No. 772,647

Int. Cl.² B62D *51/02*

U.S. Cl. 180—1 G **16 Claims**

1. A skateboard comprising

a horizontally disposed rider's platform,

a pair of laterally spaced front wheels connected beneath a forward end of said platform,

a pair of rear wheels,

mounting means connecting said rear wheels beneath a rearward end of said platform for solely permitting vertical pivotal movements of said rear wheels about a pivot axis disposed in a vertically disposed plane intersecting a longitudinal axis of said skateboard, said mounting means comprising a bracket assembly pivotally mounted beneath the rearward end of said platform and having said rear wheels rotatably mounted thereon and wherein said

bracket assembly extends rearwardly from said rear wheels,

motor means, having an output shaft, mounted rearwardly on said bracket assembly and

drive means connecting the output shaft of said motor means with only one of said rear wheels for selectively driving the same comprising a first sprocket secured to the output shaft of said motor means, a countershaft rotatably mounted on said bracket assembly, a second sprocket secured to a first end of said countershaft, an endless first chain entrained about said first and second sprockets, a third sprocket secured to a second end of said countershaft, a fourth sprocket connectible with said one rear wheel and an endless second chain entrained about said third and fourth sprockets.

4,094,373

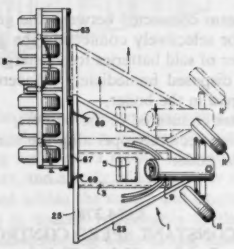
METHOD AND APPARATUS FOR CONVERTING AN AGRICULTURE MACHINE TO A TRACTOR

Arthur F. Crow, Jr., R.F.D. 3, Milford, Ill. 60953

Filed May 4, 1977, Ser. No. 793,751

Int. Cl.[2] A01B *71/00*

U.S. Cl. 180—1 F **12 Claims**



1. Apparatus for converting an agricultural machine having a substantially wide traction wheel assembly into a tractor having a traction wheel assembly of substantially less width than the traction wheel assembly of the agricultural machine, including in combination a driven part and a traction wheel assembly of substantial width, drive means powering said traction wheel assembly, further means releasably connecting said traction wheel assembly to said driven part said traction wheel assembly formed in two sections releasably connected together for use with the agricultural machine and said sections when released from one another being separable and slideable in said further means, and one of said sections being removed from the driven part, and mechanism connected at one end to said other of said sections and at the other end to said driven part, said mechanism being operable to move said other section and said driven part laterally relative to each other to align them in fore and aft relationship for operation as a tractor.

4,094,374

TWO WHEELED ELECTRICALLY POWERED VEHICLE

Herbert Adams, 1036 San Carlos Rd., Pebble Beach, Calif. 93953

Continuation of Ser. No. 500,389, Aug. 26, 1974, Pat. No. 3,934,669. This application Nov. 13, 1975, Ser. No. 631,843

The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.[2] B62M *7/10*; B62K *15/00*

U.S. Cl. 180—31 **2 Claims**

1. A powered vehicle comprising:

an integrally formed body frame bounded by a top wall, a front wall, a rear wall, and side walls;

a pair of wheels protruding from the bottom of said frame for supporting said frame;

a steering column having a lower portion rotatably carried by said frame, said lower portion of said steering column being coupled to one of said wheels to facilitate the steering of said vehicle when said steering column is rotated with respect to said frame;

an upper portion of said steering column being longitudinally slidably received in said lower portion and movable between a raised position and a lowered position;

lock means for releasably securing said upper portion to said lower portion when in said raised position, such that said upper portion of said steering column is rotatable with said lower portion when said upper portion is in said raised position and releasably secured with said lower portion;

handlebar means carried by said upper portion of said steering column, said handlebar means having opposite projecting ends extending from said upper portion, said handlebar means being movable with said upper portion relative to said steering column lower portion wherein said handlebar means extends transversely with respect to

the longitudinal axes of said frame, said handlebar means being movable with said upper portion relative to said lower portion to said lowered position such that said handlebar means is disposed in a front-to-rear fashion, said handlebar means being sized that one end of said handlebar means is in close proximity to said top wall of said frame while the portion of said handlebar means between said one end and said upper portion of said steering column is located near the mid-section of said frame, said lock means releasably securing said upper portion to said lower portion when same is in said lower position; and

the other end of said handlebar means projecting outwardly from said front wall of said vehicle, whereby when said handlebar means is in said front-to-rear lower position, said one end of said handlebar means serving as a means for lifting and carrying said vehicle, said other end of said handlebar means serving to facilitate the manual propelling of said vehicle on at least one of said wheels.

4,094,375

RIGID CONNECTION DEVICE AND ITS APPLICATION TO MOTOR CYCLES

Pierre M. Doncque, Amiens, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Mar. 26, 1976, Ser. No. 670,943

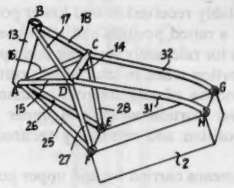
Claims priority, application France, Apr. 3, 1975, 75 10461

Int. Cl.[2] B62K *11/04*

U.S. Cl. 180—33 A **6 Claims**

1. A motorcycle having an engine block and steering column, in which the engine block is joined to the steering column by an intermediate solid which extends rigidly from two connection points on the steering column, and comprises two other connection points disposed on a cross-member at a distance from the steering column, and wherein the engine block and the intermediate solid are joined to one another by a structure of at least six connecting bars whose junctions are at least three connection points of the intermediate solid and at least three connection points of the engine block not in straight line

alignment with each other, two of said three points of the block each being connected to at least two connection points of the



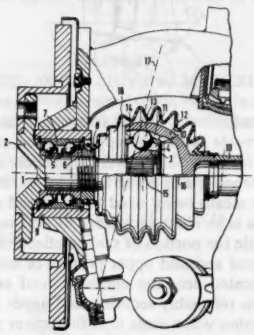
intermediate solid and two of said three points of the block being longitudinally spaced from each other.

4,094,376

BEARING ASSEMBLY FOR A WHEEL HUB

Hans-Heinrich Welschof, Rodenbach, Germany, assignor to Lohr & Bromkamp GmbH, Offenbach am Main, Germany

Filed Oct. 29, 1976, Ser. No. 736,888
Claims priority, application Germany, Oct. 31, 1975, 2548722
Int. Cl.[2] F16C *33/76*
U.S. Cl. 180—43 R **6 Claims**



1. In a bearing assembly for a wheel hub, the combination of a constant velocity universal joint mounted on a wheel support of a vehicle and having rotatable outer and inner joint members, a wheel hub, bearing means journaling said wheel hub within the wheel support and comprising an inner bearing race mounted on said wheel hub and an outer bearing race on the wheel support, said wheel hub having one end non-rotatably but detachably connected to said inner joint member and the other end of said hub having a flange to which a wheel can be attached, and a flexible boot having one end mounted upon said rotatable outer joint member and another end mounted upon one of said wheel support and said wheel hub at said wheel support to enclose said universal joint and extend over the bending range of the outer joint member and the inner joint member such that a seal is defined between rotatable and non-rotatable elements.

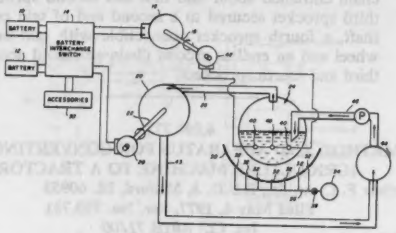
4,094,377

ELECTRICALLY POWERED VEHICLE

Herbert W. Biggs, P.O. Box 1510, Hobe Sound, Fla. 33455

Filed Apr. 15, 1976, Ser. No. 677,366
Int. Cl.[2] B60K *1/00, 3/04*
U.S. Cl. 180—65 C **6 Claims**

1. A battery powered drive system for vehicles comprising
an electric drive motor and drive shaft adapted to propel a vehicle,
a pair of electrical storage batteries,
circuit means for selectively connecting one or the other of said batteries to said motor,
a steam engine having a shaft and a generator mounted on said shaft,
a steam boiler,
a solar heater mounted in operative relation to the boiler for heating liquid in the boiler to generate steam,
a duct connected between the boiler and the engine for conveying steam generated by the boiler to the steam



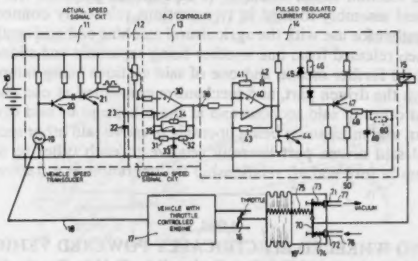
engine and returning the exhaust of the steam engine to the boiler,
switching means connected between the generator and the batteries for selectively connecting the generator to one or the other of said batteries for recharging the batteries,
gas burners disposed immediately adjacent the boiler for heating liquid in the boiler,
a gas container connected to the burners,
and means for selectively operating the burners to heat the liquid in the boiler.

4,094,378

VEHICLE CONSTANT SPEED CONTROL CIRCUIT

Hans Scheyhing, Leonberg; Helmut Fleischer, and Karl-Ludwig Abend, both of Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jul. 16, 1976, Ser. No. 705,923
Claims priority, application Germany, Aug. 22, 1975, 2537415
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—105 E **10 Claims**



1. Vehicle constant speed control system to control an engine input to maintain the speed of the vehicle at a commanded value, comprising
means (11) generating an actual vehicle speed signal;
means (12) generating a command speed signal;
means (16) coupled to the engine of the vehicle controlling energy input thereto;
a controller (13) having proportional-derivative (PD) characteristics comparing said actual speed signal and said command speed signal and generating an error signal;
and positioning means (14, 15) responsive to the error signal and controlling said energy input control means (16) and hence affecting the speed of the vehicle, said positioning

means and said vehicle responding to the error signal, proportionately, with substantial time delay;

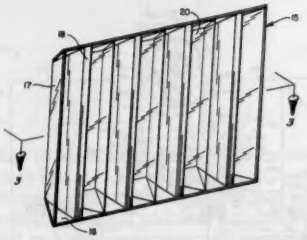
and wherein the PD controller (13) includes a control amplifier (30) having a feedback circuit comprising a T-resistance-capacitance circuit including two serially connected resistors (31, 32) and a cross connected capacitor (33).

4,094,379

SOUND-ABSORPTION PANEL

David I. Steinberger, Columbus, Ohio, assignor to Body Guard Inc., Columbus, Ohio

Filed Sep. 13, 1976, Ser. No. 722,358
Int. Cl.[2] G10K 11/04; E04B 1/99
U.S. Cl. 181—284 11 Claims



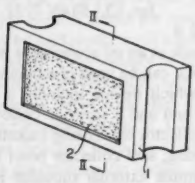
1. A sound-absorbent structure comprising an outer shell of high-density sound-deflecting material forming a cavity with sound-deflecting walls and a mouth adapted to open toward the sound emitter, and a body of low-density sound-absorbent material disposed within the cavity and extending outwardly relative thereto in spaced relationship to the walls of said cavity; said sound-deflecting walls having inner plane surfaces diverging at an angle less than ninety degrees from an inner vertex, said sound-absorbent body being in the form of a strip of material having opposed plane surfaces and inner and outer edges with its inner edge at the vertex between said sound-deflecting walls and with its outer edge exposed at a position substantially outwardly thereof, said sound-absorbent strip bisecting said cavity formed by said diverging sound-deflecting walls to provide pockets at each side of said strip, each of said pockets having a plane sound-deflecting surface formed by one of said sound-deflecting walls and a plane absorbing surface adjacent thereto and on said sound-absorbing strip which are disposed relatively at an angle of less than 45°.

4,094,380

MULTI LAYER SOUND-PROOFING STRUCTURE

Hiroshi Kobayashi, Chofu, and Nobuyoshi Kuwabara, Yokohama, both of Japan, assignors to Chiyoda Chemical Engineering & Construction Co., Ltd., Yokohama, Japan

Filed Jun. 1, 1977, Ser. No. 802,418
Claims priority, application Japan, Jun. 3, 1976, 51-64122
Int. Cl.[2] E04B 1/84
U.S. Cl. 181—285 9 Claims



1. A multi layer sound-proofing structure for absorbing sounds having frequencies of from about 100–4000 Hz, comprising:

a first layer (2) comprising a light aggregate and a binder, having a bulk density of from 0.1 to 2.0 g/cm^3 and void fraction as continuous void of from 15 to 60%;

a second layer (4) on said first layer (2), said first layer having at least a major surface uncovered by said second layer so as to serve as an incident surface for sounds;

a third layer (3) on said second layer (4) with said second layer (4) interposed between said first and third layers, said third layer comprising a light aggregate and a binder, each of which is the same as or different from those of the first layer and having a bulk density of from 0.1 to 2.0 g/cm^3 and void fraction as continuous void of from 15 to 60%;

said second layer (4) being of a material having a quality to insulate relatively high frequency sounds and to permit penetration of relatively low frequency sounds; and

a fourth layer (1) of a material having a high sound-insulating ability, and covering all free surfaces of the layered structure of said first, second and third layers except for said uncovered major surface of said first layer (2) such that said uncovered major surface of said first layer at least substantially defines the direct incident surface for sounds impinging on said sound-proofing structure.

4,094,381

AERIAL EXTENSION LADDER

Darrell F. Wilkerson, 1700 W. Reno, Oklahoma City, Okla. 73106

Filed May 2, 1977, Ser. No. 793,201
Int. Cl.[2] E06C 5/06
U.S. Cl. 182—67 4 Claims

1. An aerial ladder including a base ladder section and a top ladder section in combination with a vehicle having a flat bed and a turret mounted on the flat bed for pivoting movement about a vertical axis, the improvement comprising:

a support frame underlying and secured to said base ladder section,

said support frame having a lower end pivotally connected with

said turret for pivoting movement of its other end in a vertical plane;

a hydraulic lift cylinder extending between the turret and the support frame for tilting the latter about a horizontal axis;

a double acting hydraulic extension cylinder longitudinally secured within said support frame intermediate the ends of the latter,

said extension cylinder having a double end piston rod reciprocating from its respective ends;

a pair of pulleys connected with the respective end portions of said base ladder section;

a pulley bracket, journalling a plurality of pulleys, secured to each end of said piston rod and to the respective end portion of said support frame forming cooperating pairs of pulley brackets; and,

a base ladder section cable secured at its respective ends to respective ends of said support frame and entrained around said pair of pulleys and between the plurality of pulleys of the respective pair of pulley brackets for movement of an intermediate portion of said base ladder cable longitudinally of said base ladder section, said base ladder cable being connected intermediate its ends with said top ladder section.

4,094,382

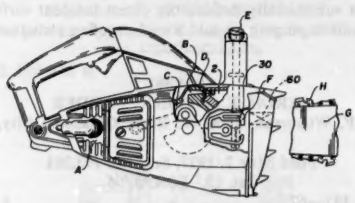
LUBRICANT FEED SYSTEM

Arthur Lee, North Vancouver, Canada, assignor to Trail Manufacturing Ltd., Trail, Canada

Filed Jun. 21, 1976, Ser. No. 699,001

Int. Cl.[2] F16N *13/08*

U.S. Cl. 184—15 R **5 Claims**



1. A lubricant feed system for use in providing a normal lubrication oil flow and a purging oil flow to cutting attachments of a chain saw having an internal combustion engine with a crankcase, a lubricant tank, means communicating the crankcase and the lubricant tank to put the lubricant tank at crankcase pressure when the engine is running, a bar pad and a guide bar for the chain, the feed system comprising:

a first passageway communicating the interior and the exterior of the lubricant tank;

a check valve in the first passageway permitting lubricant oil to flow out of the lubricant tank and openable by the pressure within the lubricant tank;

a plunger in the first passageway spaced from the check valve and extending to the exterior of the lubricant tank for manual depression;

a chamber defined in the first passageway between the check valve and the plunger;

a second passageway communicating the chamber with the bar pad of the chain saw;

the plunger being manually movable towards the check valve to close the valve and increase the pressure in the chamber and the second passageway to a purging pressure to purge the second passageway;

a metering valve in the second passageway to regulate the normal lubrication oil flow from the chamber to the bar pad under the influence of the pressure in the lubricant tank;

manually operable control means for the metering valve linked to the metering valve by a link and extending to the exterior of the chain saw to permit manual movement of the metering valve to a predetermined position ranging from a closed position to an open position to regulate normal lubrication oil flow;

resilient means urging the metering valve to the predetermined position against the normal lubrication oil flow under the influence of the pressure in the lubricant tank;

the link between the control means and the metering valve co-acting with the resilient means to maintain the metering valve in the predetermined position under normal lubrication oil flow at lubricant tank pressure but permitting (a) the metering valve to move from the predetermined position to a fully open position upon application of purging pressure to the chamber, to the second passageway and to the metering valve by the plunger and (b) the metering valve to return to the predetermined position upon cessation of the purging pressure.

4,094,383

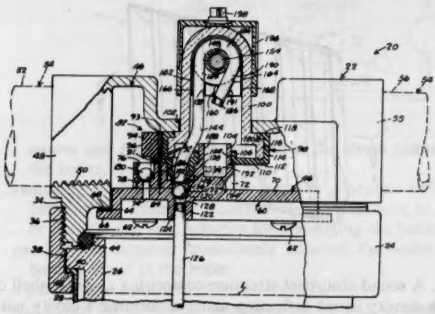
AIR LINE LUBRICATOR

George E. Thrasher, Jr., Sterling Heights, Mich., assignor to Master Pneumatic-Detroit, Inc., Sterling Heights, Mich.

Filed Oct. 6, 1976, Ser. No. 730,142

Int. Cl.[2] F16N *7/32*

U.S. Cl. 184—55 A **32 Claims**



1. In a lubricator which introduces lubricant from a reservoir into an air line at a metered rate under pressure differential induced by air flowing through a passageway in the lubricator connected into the air line, improved structure which comprises,

tubing which has an upstream end positioned to receive lubricant from said reservoir under said pressure differential,

said tubing having a downstream end through which lubricant is delivered,

said tubing having wall portions between said ends which can be squeezed inwardly to reduce the effective area of the tubing interior,

and means operable to squeeze said wall portions sufficiently so that the reduced effective area thereof forms a restriction limiting to said metered rate the flow of lubricant through said tubing.

4,094,384

BAYONET CONNECTING SYSTEM FOR COLLECTOR BOWL ATTACHMENT TO CONNECTING HOUSING OF COMPRESSED AIR CONDITIONING DEVICE

Roland Heilmann, Neuenhaus, Germany, assignor to Firma Festo-Maschinenfabrik Gottlieb Stoll, Esslingen, Germany

Filed Oct. 19, 1976, Ser. No. 734,268

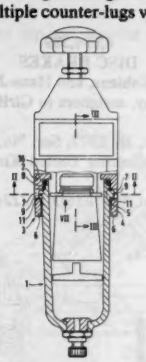
Claims priority, application Germany, Oct. 22, 1975, 7533573[U]

Int. Cl.[2] F16N *7/32*

U.S. Cl. 184—55 A **13 Claims**

1. A device such as an oil atomizer, a pressure regulator, or a separator, which can be used in a compressed air conditioning apparatus, which device includes a connecting housing having an open end and a separate collector bowl having an open end, said collector bowl being lockable together with said connecting housing, said collector bowl having near its open end thereof multiple external shoulder means extending peripherally outwardly therefrom to form multiple counter-lugs, said connecting housing having internal means forming inwardly extending open areas to form multiple lugs at its open

end thereof with discontinuity areas therebetween, such that the multiple counter-lugs fit through the discontinuity areas when said open end of said collector bowl is fitted within said open end of said connecting housing, and when said collector bowl is turned the multiple counter-lugs will engage behind the



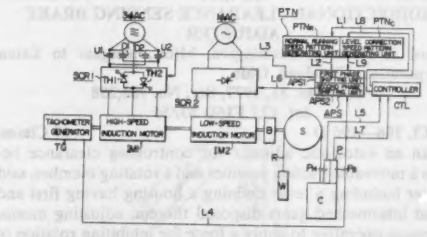
multiple lugs to connect said collector bowl to said connecting housing; both said collector bowl and said connecting housing having interengageable means for locking said collector bowl to said connecting housing when said collector bowl is turned so that said multiple counter-lugs fully engage said multiple lugs.

4,094,385

LEVELLING APPARATUS FOR AC ELEVATOR

Yasuyuki Maeda; Nobuo Mitsui, both of Katsuta; Tadao Kameyama, Ibarakimachi, and Katsu Komuro, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 14, 1976, Ser. No. 677,071
Claims priority, application Japan, Apr. 21, 1975, 50-47438
Int. Cl.² B66B *1/40*
U.S. Cl. 187—29 R **33 Claims**



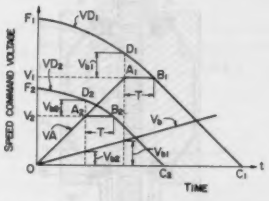
1. A levelling apparatus for an AC elevator system comprising a three-phase induction motor, motoring torque control means for controlling the motoring torque produced by said motor, braking torque control means for controlling the braking torque produced by said motor until a speed of said motor reaches a very low speed in the vicinity of zero, and an elevator car driven for vertical movement by said motor through a rope, wherein the improvement comprises level error detecting means for detecting dislocation of a floor level of said elevator car in either direction from the floor level of a target floor and means for controlling the torque produced by said motor by actuating said motoring torque control means and said braking torque control means in response to an output of said level error detecting means.

4,094,386

SPEED COMMAND GENERATOR FOR ELEVATOR

Kazuo Suzuki, Katsuta, and Hiroyuki Kataoka, Nakamachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 30, 1976, Ser. No. 682,043
Claims priority, application Japan, May 7, 1975, 50-54986
Int. Cl.² B66B *1/30*
U.S. Cl. 187—29 R **9 Claims**



1. A speed command generator for an elevator comprising means for generating a first speed command signal varying depending on the distance between the existing position of an elevator car and the target floor position, means for generating a second speed command signal varying with the lapse of time in response to the application of the starting instruction to the elevator car, comparing means for comparing said first speed command signal with said second speed command signal thereby delivering an output when said first and second speed command signals satisfy a predetermined relationship, and means for storing the value of said second speed command signal in response to the appearance of the output from said comparing means, thereby to drive the elevator car according to a continuous speed pattern consisting of a sequence of speed patterns provided by said second speed command signal, said stored value and said first speed command signal, wherein the improvement comprises means for generating a reference command signal varying depending on the variation of said second speed command signal, said comparing means being responsive to said reference command signal for delivering an output when the difference between said first speed command signal and said second speed command signal is reduced to a value less than that of said reference command signal.

4,094,387

INERTIA DEPENDENT DEVICE FOR PREVENTING AND PERMITTING RELATIVE ROTATION BETWEEN TWO MEMBERS

Roger Patrice Pelat, Paris, and Gildas Le Pierres, La Ferte Alais, both of France, assignors to International Vibration Engineering, Boutigny-sur-Essonne, France

Filed Oct. 8, 1976, Ser. No. 730,946
Claims priority, application France, Oct. 8, 1975, 75 30848; Jan. 30, 1976, 76 02561; Jan. 30, 1976, 76 02562
Int. Cl.² F16F *7/10*
U.S. Cl. 188—1 B **22 Claims**

1. A device for inhibiting relative movement between two articles, which device comprises:

a support connected to one of said articles,

a sliding member connected to the other article and capable of sliding through said support without rotating with respect to said support,

a rotating member adapted to be rotated by relatively slow movement of the said sliding member to permit said relative movement between said articles, and to resist rotation and thereby inhibit said relative movement in response to more rapid movement of said sliding member,

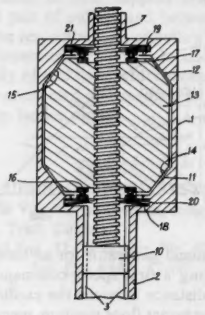
two braking surfaces connected to said support,

said rotating member having two abutment surfaces positioned to be applied against the said braking surfaces upon relative axial movement between said rotating member and said support in one direction or the other,

said device further comprising two prestressed elastic means

for normally maintaining said rotating member spaced from said braking surfaces, and abutment means for preventing each of said elastic means for moving said rotating member, when said rotating member is not urged against said elastic means,

said rotating member being connected to the sliding membe



so as to be started in rotation by a movement of low acceleration of said sliding member, and to be driven longitudinally toward one of said braking surfaces of said support against the resistance of one of said elastic means when said acceleration is greater and sufficient to drive said rotating member with a force greater than the prestress of said elastic means.

4,094,388

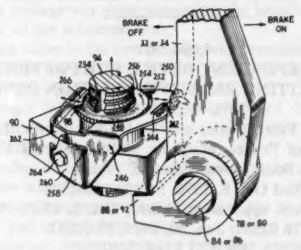
AUTOMATIC BRAKE ADJUSTING MEANS

Edward J. Falk, St. Louis County, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Division of Ser. No. 703,933, Jul. 9, 1976, abandoned. This application Mar. 14, 1977, Ser. No. 776,846

Int. Cl.² F16D 65/56

U.S. Cl. 188—71.9 **7 Claims**



1. In a vehicular disc brake system having at least one friction member retained in a brake caliper and actuated by applying mechanical motion thereto and wherein brake wear results from braking friction, the improvement of an automatic disc brake adjuster mechanism comprising:

(a) an adjuster nut containing a threaded hole;

(b) a threaded adjusting screw engaged in said threaded hole;

(c) a star wheel on said threaded screw;

(d) means for relatively non-rotating connecting of said star wheel to said threaded adjusting screw;

(e) a spring finger resiliently connected to said adjuster nut in ratchetable contact with said star wheel;

(f) means for connecting the mechanical motion applied to said friction member to said spring finger;

(g) means for compensating for said wear when said star wheel and attached adjusting screw are rotated by said spring finger; and

(h) retainer means attached to said adjuster nut for retaining said star wheel adjacent said adjuster nut.

4,094,389

DISC BRAKES

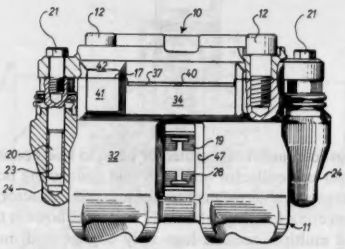
Hermann Josef Brix, Koblenz, and Hans-Jurgen Wienand, Steimel, both of Germany, assignors to Girling Limited, Birmingham, England

Filed Mar. 28, 1977, Ser. No. 781,989

Claims priority, application United Kingdom, Apr. 1, 1976, 13264/76

Int. Cl.² F16D 55/224

U.S. Cl. 188—73.3 **6 Claims**



1. A disc brake caliper which comprises a body member, a bridge member and means securing said members together along a parting plane, said body member having two separate co-planar parting faces in said parting plane with respective bolt holes therein and having a cylinder portion which projects forwardly beyond said parting plane, and said bridge member having two complementary parting faces with respective bolt holes therein aligned with said bolt holes in said body member and having a recessed portion between the last-mentioned parting faces and overlying but spaced from said forwardly projecting cylinder portion of said body member, said securing means comprising two bolts passing respectively through said aligned bolt holes.

4,094,390

BIDIRECTIONAL CLEARANCE SENSING BRAKE ADJUSTER

Richard F. Neuman, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 31, 1977, Ser. No. 783,258

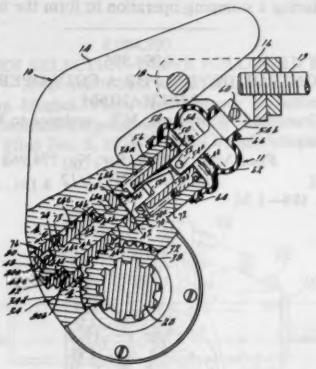
Int. Cl.² F16D 65/56

U.S. Cl. 188—196 D **17 Claims**

1. In an automatic adjuster for controlling clearance between a moveable friction member and a rotating member, said adjuster including a lever defining a housing having first and second intermeshed gears disposed therein, adjusting means, and means operative to apply a force for inhibiting rotation of said gears by said adjusting means in at least one direction relative to said lever; said first gear adapted for driving connection with said moveable member; said second gear operative to adjustably lock said first gear to said lever and to transmit forces between said lever and said first gear for moving said friction member into engagement and disengagement with said rotating member; said adjusting means operative to apply a torque to rotate said second gear relative to said lever and effect a clearance adjusting rotation of said gear in response to pivotal movement of said lever; and wherein said improvement comprises:

a two-way torque limiting ratchet clutch having torque transmitting capacity in both drive directions, said clutch operative in one drive direction to resist slipping and to allow a clearance decreasing rotation of said second gear

while said forces transmitted are below a first predetermined level, said clutch operative in said one drive direction to slip and prevent said clearance decreasing rotation in response to said forces transmitted exceeding said first predetermined level, said clutch operative in the other drive direction to slip and prevent a clearance increasing



rotation in response to said transmitted forces exceeding a second predetermined level, and said clutch operative in said other drive direction to slip and prevent said clearance increasing rotation in response to said inhibiting force when said transmitted forces fall below said second predetermined level.

4,094,391

SUITCASE WITH WHEELS AND TRANSPORTING HOOK

Debrilla M. Ratchford, 1900 S. Eads St., Arlington, Va. 22202

Filed Apr. 18, 1977, Ser. No. 788,529
Int. Cl.² A45C *13/26*
U.S. Cl. 190—18 A **15 Claims**

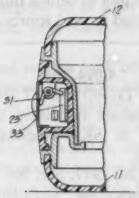
1. A suitcase engaging hook having a handle, a support member configured to engage suitcases, a shank connecting the handle and support member, the support member comprising a relatively long portion having first and second ends, the first end connected to the shank at an angle, retaining means connected to the second end for preventing accidental removal of suitcases from the support member, wheel carrier assemblies connected to a suitcase engaged by the suitcase engaging hook, and wheel assemblies rotatably supported by the wheel carrier assemblies.

4,094,392

LUGGAGE LATCH MECHANISM

James S. Gregg, Denver, and William J. Reynolds, Arvada, both of Colo., assignors to Samsonite Corporation, Denver, Colo.

Filed Mar. 1, 1977, Ser. No. 773,375
Int. Cl.² A45C *13/10*
U.S. Cl. 190—41 R **4 Claims**



2. In a luggage case having first and second case sections closable upon each other, the first case section including a latch mechanism for releasably joining the case sections together when they are closed, said latch mechanism being released by moveing a drive plate along a first direction, comprising:

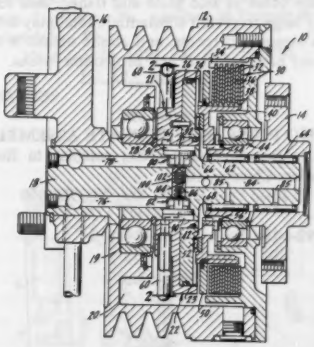
a detent mounted to said first case section to rotate under the influence of gravity alone in a plane transversely of the direction of movement of said drive plate from a first position preventing said drive plate movement to a second position out of the path of movement of said drive plate.

4,094,393

CLUTCH MECHANISM

Romas Balys Spokas, Rockford, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 27, 1977, Ser. No. 791,370
Int. Cl.² F16D *43/25, 25/08, 13/74*
U.S. Cl. 192—82 T **7 Claims**



1. A temperature responsive drive mechanism comprising a driving member and a driven member, a friction clutch connected between said members adapted to provide a releasable coupling therebetween, an actuator mechanism associated with said members and adapted to engage said clutch in response to fluid pressure, a source of pressure and a sump for said mechanism, a fluid for connecting a said source to said actuator, said fluid circuit including a valve having temperature responsive means exposed to a medium of varying temperature, said valve having two positions, a pair of fluid passages connecting said drive mechanism and said valve, said valve being connected to said source, one of said passages connected to said actuator to supply pressure thereto, said valve being operative to alternatively connect said source to either of said conduits connected to said drive mechanism and to alternatively connect said conduits to a return passage to said sump,

whereby one of said passages will supply pressure to the actuator to engage the clutch when supplied with fluid pressure by the valve when the temperature of said medium exceeds a predetermined maximum, and the other of said passages when supplied with pressure providing lubricant supply to said drive mechanism when said valve is the other position and said medium is below a predetermined temperature; said pair of passages alternatively acting as return fluid passages when the other passage is connected to said source.

4,094,394

CLUTCH THROW-OUT DEVICE

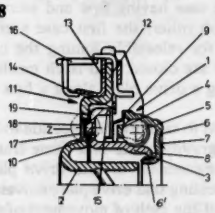
Walter Köder, and Reinhart Hillmann, both of Schweinfurt, Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed Mar. 30, 1977, Ser. No. 783,005

Claims priority, application Germany, Apr. 10, 1976, 7611433[U]

Int. Cl.² F16D *19/00*

U.S. Cl. 192—98 **9 Claims**



1. In a clutch throw-out device having a self-centering thrust bearing with a fixed bearing ring, the fixed bearing having a radially extending flange, a pressure plate, and means coupling said pressure plate to said flange to inhibit relative rotation between said flange and pressure plate, the improvement wherein said coupling means comprises projection means on one of said plate and flange and positioned to extend into a recess in the other of said plate and flange, said recess being sufficiently large to permit substantial radial play between said projection means and recess, and elastic means in said recess between said pressure plate and projection means.

4,094,395

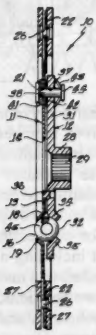
TWO PIECE DRIVEN PLATE ASSEMBLY

William Lee Brown, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 2, 1976, Ser. No. 720,040

Int. Cl.² F16D *3/14*

U.S. Cl. 192—106.2 **19 Claims**



1. A one-piece stamped hub element for a two-piece clutch plate assembly having coil springs between such element and its friction clutch plate, comprising a barrel and an integral flange, said barrel extending entirely from one side of said flange, said flange having spring pockets receiving the coil springs with each pocket having an inner and an outer spring retaining lip, and pivoting means on said flange for positioning of said friction clutch plate including a plurality of bosses projecting from the side of said flange opposite but closely adjacent to said barrel, said bosses being extruded from the flange during a stamping operation to form the hub element.

4,094,396

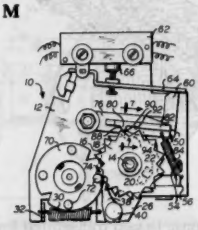
CONTROL DEVICE FOR A COIN OPERATED MECHANISM

Harry Greenwald, Whitestone, N.Y., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Mar. 7, 1977, Ser. No. 774,963

Int. Cl.² G07F *15/12*

U.S. Cl. 194—1 M **5 Claims**



1. A control device for a coin operated mechanism, said device comprising:

(a) a mounting plate;

(b) a shaft projecting from said mounting plate;

(c) a ratchet wheel and a star wheel rotatably mounted on said shaft in axially spaced relation, each of said wheels having a pin thereon projecting toward the other wheel, and said pins each being located at an equal radial distance from the axis of said shaft;

(d) first stepping means oscillatably mounted on said shaft and operatively connected to the coin operated mechanism, said stepping means comprising a pawl assembly engagable with the teeth of said ratchet wheel to step-wise rotate said wheel in one direction by a distance of one tooth upon movement of said stepping means;

(e) switch means mounted on said plate having a switch movable from a normally closed state to an open state;

(f) a spring biased switch operating arm pivotally mounted on said plate and operatively connected to said switch, said arm having a follower portion engagable with the teeth of said ratchet wheel;

(g) said switch being in its closed state when the follower portion of said switch operating arm is located between the teeth of said ratchet wheel, and said switch being moved to its open state when said follower portion is displaced to the outer end of a tooth of said ratchet wheel;

(h) an electrically operated timer mounted on said plate having an energizing circuit controlled by said switch, said timer comprising second stepping means operable when said switch is in its closed state to engage with the teeth of said star wheel and intermittently rotate said star wheel in the same direction of rotation of said ratchet wheel, such rotation of said star wheel causing the pin thereof to engage with the pin of said ratchet wheel;

(i) the follower portion of said switch operating arm being displaced to the outer end of a tooth of said ratchet wheel upon conjoint rotation of said star wheel and said ratchet wheel in said one direction by the engagement of said pins to open said switch; and

(j) a spring biased lever member pivotally mounted on said plate and engagable with said star wheel, said lever having restraining means located to engage one of the teeth of said star wheel upon said conjoint rotation of said star wheel and said ratchet wheel to prevent counterrotation

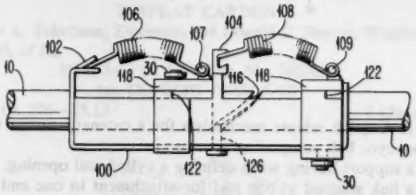
of said star wheel in a direction opposite to said one direction when said switch is in its open state, the engagement of said pins preventing counterrotation of said ratchet wheel in said opposite direction wherein said switch follower portion is held in its displaced position on the outer end of said ratchet wheel tooth to prevent the inadvertent movement of said switch to its closed state.

4,094,397

TYPEWRITER SELECTION DRIVE FOLLOWER BLOCK AND SHUTTLE ASSEMBLY

Frank Marion Hughes, Paris, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1977, Ser. No. 756,307
Int. Cl.² B41J *23/04*
U.S. Cl. 400—161.4 **2 Claims**



1. A shuttle assembly for use in a single element typewriter comprising:

a shuttle body, conformed to move axially over a rotating shaft;

a projection extending from the shuttle body toward the axis of said rotating shaft to engage a cam groove formed in the surface of said shaft;

at least one follower member;

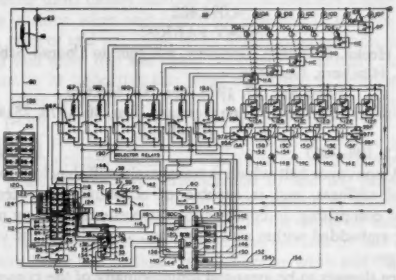
biasing means for biasing said follower member against said shuttle body and in an axial direction, said follower member having a stop engaging surface thereon whereby said follower member upon the engagement of said engaging surface with a stop member will cease to translate and said shuttle body will continue to translate and said biasing means will provide a force through said follower member against said stop member.

4,094,398

COMPOSITE VENDING CIRCUIT DISPOSABLE IN SINGLE- AND MULTIPLE-PRICED CONFIGURATIONS

Vernon D. Camp, Chattanooga, Tenn., and Raymond D. Bowman, Fort Oglethorpe, Ga., assignors to Cavalier Corporation, Chattanooga, Tenn.

Filed Jun. 27, 1975, Ser. No. 590,855
Int. Cl.² G07F *11/00*
U.S. Cl. 194—10 **13 Claims**



1. A composite vending circuit disposable in either of a first, single-priced circuit configuration adapted to be coupled to a first, single-priced coin-operated vend mechanism for establishing a first energization circuit in response to coin deposit of at least a first value, and of a second, multi-priced circuit configuration adapted to be coupled to a second multi-priced coin-operated vend mechanism for establishing at least a second energization circuit in response to coin deposit of at least a second value and for establishing a third energization circuit in response to coin deposit of at least a third value differing from the second value, said composite vending circuit comprising:

a. a plurality of vend motors each corresponding to one of a plurality of columns of articles adapted to be selectively dispensed from its corresponding column, one-at-a-time, according to the choice of a customer;

b. a plurality of selector switches, one for each vend motor, adapted upon selective actuation by the customer to energize a corresponding vend motor for dispensing an article from a selected column;

c. a plurality of selector relays, one for each corresponding vend motor and selector switch, having an operating winding adapted to be selectively energized upon actuation of its corresponding selector switch; and

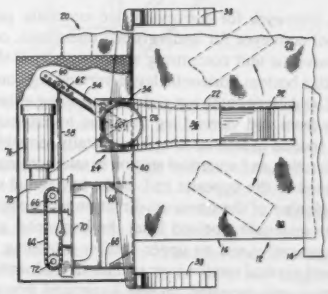
d. switch means disposable to a first position for connecting said selector relays in series with each other and for connecting the first energization circuit of the single-priced coin-operated vend mechanism to said series-connected selector relays whereby said circuit is disposed in its single-priced circuit configuration, and to a second position for connecting independently the second and third energizing circuits, respectively, to first and second groups of corresponding selector relays and for connecting independently said first and second groups of selector relays to corresponding first and second groups of selector switches, whereby said composite circuit is disposed in its multi-priced circuit configuration.

4,094,399

OSCILLATING FEED ASSEMBLY AND DRIVE ESPECIALLY FOR A DRYER CONVEYOR

K. A. George, Levittown, Pa., assignor to Procter & Schwartz, Inc., Philadelphia, Pa.

Filed Ju'. 28, 1976, Ser. No. 709,494
Int. Cl.² B65G *47/20*
U.S. Cl. 198—535 **5 Claims**



1. A dryer for particulate material comprising

a dryer housing;

conveyor means having a conveyor carrying run adapted to convey particulate material to said housing;

a distributing feed-chute including a discharge end for uniformly distributing particulate material onto the conveyor means carrying run;

pivot means pivotally supporting said feed-chute so that the discharge end is above the conveyor carrying run;

a drive means adapted to pivot said feed-chute so that it traverses the conveyor carrying run with quick reversal of

the feed-chute discharge end at the end of each traverse, said drive means thereby being subjected to rapid acceleration and deceleration forces, said drive means including a continuous chain drive;

said chain drive comprising a double strand roller chain, a plurality of pins connecting successive links of said chain strands, an adjacent pair of said pins extending laterally from said chain strands, and a bearing pin supported by said pairs of pins;

a pair of spaced-apart sprockets on which said chain drive is mounted, said sprockets being of relatively small diameter adapted to effect said quick reversal of the feed-chute discharge end;

a lever arm to pivot said chute; and

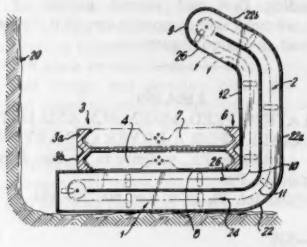
linkage means between said chain drive and lever arm connected to said chain drive bearing pin whereby the feed-chute discharge end reciprocatingly traverses the conveyor means carrying run on movement of the bearing pin between the chain drive sprockets.

4,094,400

CONVEYOR FOR CONVEYING FINE MATERIAL

Ernst Braun, and Gert Braun, both of Essen-Heisingen, Germany, assignors to Halbach & Braun, Germany

Filed Sep. 27, 1976, Ser. No. 727,250
Claims priority, application Germany, Oct. 2, 1975, 2543987
Int. Cl.² B65G *19/08, 19/14*
U.S. Cl. 198—607 **6 Claims**



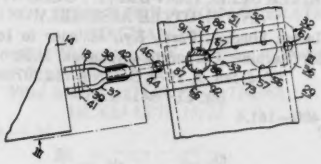
1. A conveyor for conveying fine materials, particularly a fine coal conveyor for underground operations, comprising a first conveyor unit comprising a substantially C-shaped housing with a bottom horizontal leg, a vertical leg connecting one end of said horizontal leg and an upper leg extending backwardly from said vertical leg over said horizontal leg, a horizontal section in said housing horizontally movable in a transport direction and a vertical section in said housing vertical leg connected to the opposite end of the horizontal section from the beginning of the transport direction in a position to direct the fine materials received from the horizontal section vertically upwardly, and an upper section extending backwardly from said vertical section over said horizontal section, a second conveyor unit mounted on the horizontal housing leg and located adjacent said first conveyor unit including upper and lower superposed troughs having respective upper and lower conveyor sections running in respective upper and lower troughs, said horizontal section of said first conveyor unit having a reversal end and being disposed to traverse at least a portion of said lower section of said second conveyor in the vicinity of said reversal end and substantially at right angles to the direction of transport on said horizontal section, said horizontal section receiving the fine materials from the lower section and delivering the fine materials to the vertical section for movement thereon, said vertical section having a discharge directed to said upper section.

4,094,401

QUICK RELEASE FOR CATERNARY ROLLERS

Gerald D. Sanderson, Belleville, Canada, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 17, 1976, Ser. No. 751,377
Int. Cl.² B65G *15/60*
U.S. Cl. 198—827 **7 Claims**



1. A quick release mechanism for a catenary carrier for a conveyor belt comprising:

a support having walls defining a cylindrical opening;

a link adapted at one end for attachment to one end of a catenary carrier for a conveyor belt moving in a predetermined direction and including wall means at its other end defining an elongated slot with opposite closed ends, said wall means including a pair of spaced walls defining a channel portion of said slot of predetermined width and an arcuate wall defining an annular portion at the closed end of said slot nearest said carrier, said annular portion having a diameter of greater dimension than the width of said channel portion of said slot; and

a locking pin having

a cylindrical bearing portion pivotally mounted in said cylindrical opening, and

a neck disposed in said slot presenting a pair of diametrically opposite concentric annular surfaces and a pair of diametrically opposite faces spaced a distance from one another less than the diameter of said annular surfaces and less than the width of said channel portion of said slot;

said pin being pivotable between a locking position wherein said annular surfaces engage diametrically opposite portions of said arcuate wall whereby said annular portion of said slot is supported on said neck of said pin and a release position wherein said faces are aligned with said channel portion of said slot thereby allowing said link to slide on said pin to place said catenary carrier in a lowered position wherein said pin abuts the wall means at the closed end of said slot remote from said carrier.

4,094,402

INLAY FABRIC

Hugo Heeke, Hamburg, Germany, assignor to Conrad Scholtz AG, Hamburg, Germany

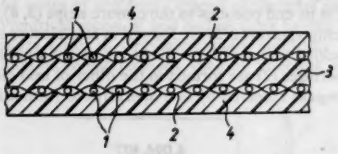
Filed Apr. 27, 1976, Ser. No. 680,693
Claims priority, application Germany, Apr. 30, 1975, 2519448
Int. Cl.² B29H *9/02*
U.S. Cl. 198—847 **11 Claims**

1. A conveyor belt which is transverely stiff, has low longitudinal stiffness, and is capable of accommodating tensile forces, comprising, in combination, an elastomer and an inlay fabric embedded within said elastomer, said inlay fabric comprising:

warp threads to be arranged longitudinally of the conveyor belt; and

relatively stiff weft threads extending transversely of the warp threads, said weft threads having a diameter in the

range of 0.2 mm. to 1.0 mm., the density of said weft threads ranging from 60 to 120 threads per 100 mm. of



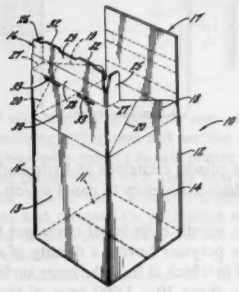
fabric length, and said warp threads having a crimp between 6.5% and 22.5%.

4,094,403

DISPLAY CARTON

Bram A. Takefman, Evanston, and Donald C. Baxter, Winfield, both of Ill.

Filed Jan. 17, 1977, Ser. No. 760,028
Int. Cl.² B65D *79/00, 5/02*
U.S. Cl. 206—45.13 **4 Claims**



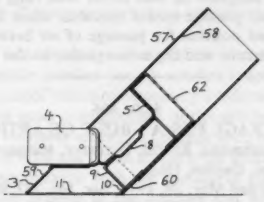
1. A combined shipping and merchandising carton comprising opposite top and bottom panels and two opposing side panels joined to margins of the top and bottom panels to form a carton of generally rectangular cross-section, inner and outer flaps forming an end closure for said carton; said inner flap being hingedly joined to an end margin of said bottom panel to swing outwardly relative to the latter from a closed position in which said inner flap is disposed substantially perpendicular to said bottom panel to an open position in which said inner flap is disposed substantially in the plane of said bottom panel, side flaps hingedly joined to end margins of said side panels and also hingedly joined along their bottom margins to the adjacent margins of said inner flap, a fold line extending across each of said side flaps and permitting each side flap to fold upon itself and swing to a closed position when said inner flap is swung to its closed position and to unfold and swing to an open position when said inner flap is swung to its open position, each of said side flaps, when in its closed position, underlying said inner flap and being disposed substantially perpendicular to its respective side panel and, when in its open position, being disposed substantially in the plane of its respective side panel; a said outer flap being hingedly joined to an end margin of said top panel to swing outwardly relative to the latter from a closed position in which said outer flap is disposed in a plane substantially perpendicular to said top panel and overlies said inner flap, and an open position in which said outer flap is disposed substantially in the plane of said top panel, means for fastening a lower end portion of said outer flap to a lower end portion of said inner flap when said flaps are in said closed positions thereby to hold all of said flaps in said closed positions during shipping, means enabling the freeing of an upper portion of said outer flap from the secured lower portion of said outer flap thereby to permit all of said flaps to be swung open to merchandising positions after shipping; and means for holding said flaps in said merchandising position including tabs projecting from each side flap, each tab being joined to its respective side flap along a hinge line which permits each tab to underly said inner flap when in closed position and to be swung inwardly to a position in which said tab is disposed in an upright plane when said inner flap is in merchandising position, said inner flap being defined by a main body portion extending outwardly from said bottom panel to a location adjacent said tabs when the latter are in said merchandising positions, said inner flap also including a first panel hingedly joined to the outer end of said body portion to swing upwardly to a merchandising position along the outer faces of said tabs when the latter are in their merchandising positions, said inner flap further including a second panel hingedly joined to said first panel to wrap downwardly around the upper ends of said tabs when the latter are in their merchandising positions and to fold to a merchandising position lying along the inner faces of said tabs, an ear on the free edge of said second panel, and a slot in said body portion for receiving said ear to lock said tabs and said first and second panels in their meerchandising positions.

4,094,404

COMBINED DISPLAY AND SHIPPING PACKAGE

Paul D. Miller, New York, and V. Lorenzo Porcelli, Ossining, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 14, 1977, Ser. No. 777,118
Int. Cl.² B65D *5/50, 5/52*
U.S. Cl. 206—45.15 **2 Claims**



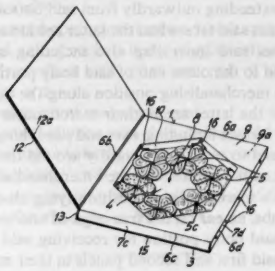
1. An improved shipping and display package comprising an outer sleeve, and an inner shell, said outer sleeve having an outer and inner surface, said inner shell having a front, back, side and end surfaces with at least one end surface inclined to the front surface of said inner shell, a display tray within and secured to said inner shell, an upper surface of said display tray lying in the same plane as the front surface of the inner shell, a well located on the front surface of said inner shell for supporting said display tray within the inner shell, said display tray being constructed to accommodate a display item in one of two alternate positions, a first position in which the display item is totally enclosed within said tray with no portion of said item extending above the top surface of said tray and a second position in which the displayed item protrudes above the top surface of said display tray, when the display item is in said second position said outer sleeve is in a position above said display item, thereby enlarging the surface area of the display package in a telescoping manner, the combined centers of gravity of the displayed item and the display package being located in a position that prevents the display package from tipping when said package is resting on said inclined end surface.

4,094,405

SALES PACKAGING

Walther Ruger, Munich, Germany, assignor to Refeka Werbemittel GmbH, Munich, Germany

Filed May 12, 1976, Ser. No. 685,514
Int. Cl.[2] B65D *85/50*
U.S. Cl. 206—423 11 Claims



1. A rigid container having foldable portions, said container designed to protect fragile contents while allowing said contents access to air comprising:

a. a base;

b. compartments mounted essentially on said base defining a folding compartment zone, each compartment foldable about its contents in a manner which allows the contents access to air;

c. a cover wall ring surrounding the folding compartment zone having an opening defining the area of said zone, said cover wall ring having outer edges defining the outer periphery thereof, and inner edges defining the opening thereof;

d. outer side walls extending downwardly from said outer edges, respectively, for supporting and elevating said cover wall ring in spaced relationship to said base; and

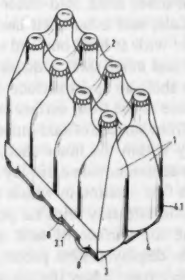
e. a cover hingable on said cover wall ring, said container having air passage means operable when the cover is in the closed position for passage of air between the compartment zone and the area exterior to the container.

4,094,406

PACKAGE FOR A GROUP OF ARTICLES

Jurgen Zietzschmann, Kordel, Germany, assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 28, 1977, Ser. No. 782,302
Int. Cl.[2] B65D *65/18*
U.S. Cl. 206—432 14 Claims



1. A package for a group of articles, particularly bottles, cans, or the like, comprising a wrapper placed around the group of articles and open at opposing ends, said wrapper being formed from a substantially rectangular blank which has two oppositely disposed closure portions adapted to be joined together for securing said wrapper, characterized in that the blank is provided at both of said closure portions with a closure strip (3, 4) made of paperboard and in that the area of said blank intermediate said closure portions having end portions and being partially of a film of plastic material (2) which is joined at its end portions to the closure strips (3, 4), and in that tightening apertures (5) are formed in said closure strips and in that locking tongues (6) are formed in one of said closure strips and apertures (7) are formed in the other of said closure strips said tongues received by said apertures to form said wrapper.

4,094,407

NONPANELLING PLASTIC OIL CONTAINER

Jack Hurst, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Feb. 4, 1977, Ser. No. 765,502
Int. Cl.[2] B65D *81/00*
U.S. Cl. 206—524.3 3 Claims

1. A filled plastic container of hydrocarbon lubricating oil having a reduced tendency to panel which consists essentially of:

(a) a wide mouth cylindrical container fabricated from an ethylene polymer having a density of at least about 0.950 gms/ml in which at least the inner surface of the container contains about 10 – 1,000 ppm of carbon black and the entire body of the container contains at least about 1.0 wt. % of TiO_2 pigment,

(b) a liquid hydrocarbon lubricant which substantially fills the container, and

(c) a cap affixed to and sealing the container.

4,094,408

CONTAINERS FOR PILLS AND THE LIKE

John B. Ford, 6118 Webber-Cole Rd., Kinsman, Ohio 44428

Filed Feb. 14, 1977, Ser. No. 768,141
Int. Cl.[2] B65D *83/04*
U.S. Cl. 206—534 3 Claims

1. A container for carrying medical capsules, pills, and the like on one's person for handy and convenient use, comprising:

a tubular center section and two tubular end sections connected to opposite ends of said center section in axially aligned relation,

said center section being H-shaped in longitudinal section and providing tubular cylindrical portions at its opposite ends and an intermediate transverse wall which blocks communication between the interior of said cylindrical portions,

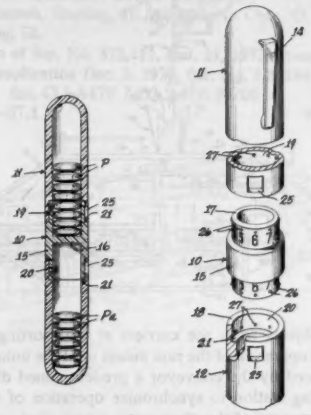
each of said end sections being in the form of an elongated barrel adapted to contain pills and the like, each barrel being closed at an outer end and open at an inner end,

the open inner end of each barrel having a smooth surfaced cylindrical recess of a size closely and rotatably receiving a respective one of said center section cylindrical portions thereby to effect assembly of said end sections with said center section, with the interiors of said end sections isolated from each other by said transverse wall,

said center section cylindrical portions and said end section

cylindrical recesses having like diameters whereby either said end section may be cooperatively associated with either end of said center section,

each said center section cylindrical portion having a circumferential series of uniformly spaced projections and each said cylindrical recess of said end sections having a complementary series of circumferentially uniformly spaced projection-receiving recesses, thereby effecting snap fit



association of said end sections with said center section and further retaining either said end section in a selected rotational position with respect to said center section, and,

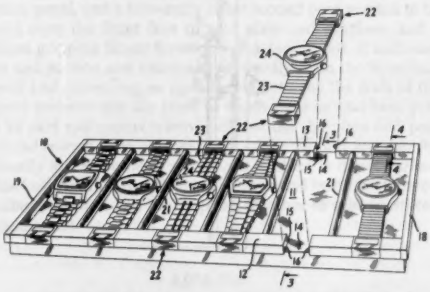
indicia associated respectively with each said end sections and said center section and circumferentially related to said projections and recesses for indicating selected rotational positions of said center and end sections with respect to each other.

4,094,409

SAMPLE DISPLAY TRAY

Douglas M. Spranger, Brooklyn; Malcolm J. Brookes, New York, both of N.Y., and Paul J. Mulhauser, Paramus, N.J., assignors to Seiko Time Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,924
Int. Cl.[2] B65D *1/36, 85/40*
U.S. Cl. 206—566 **9 Claims**



1. Apparatus for releasably holding articles to be displayed comprising:

a generally planar display surface having a raised edge portion formed with a recess;

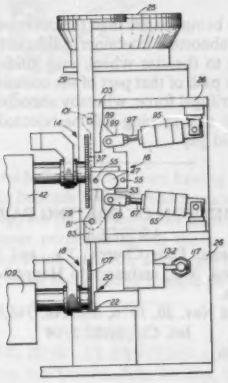
a clasp assembly to be releasably secured over one end of an article and consisting of a slotted enclosure having a pivotally mounted member formed with a generally inwardly depending finger movable upon pivoting of said member alternately to press against and release the article inserted within the slot, a sidewall of said enclosure being resiliently formed with a throated detent opening outwardly to receive a corresponding boss element formed on and projecting away from a corresponding sidewall of said recess in the edge portion of the display surface, the width of the throat of said detent being slightly less than the diameter of said boss.

4,094,410

METHODS OF AND APPARATUS FOR CONVEYING, TESTING AND SORTING ARTICLES AND STRAIGHTENING THEIR LEADS

Charles R. Fegley, Laureldale; Richard H. Morrow, Temple, and Arthur G. Naylor, Wyomissing, all of Pa., assignors to Western Electric Co., Inc., New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,279
Int. Cl.[2] B07C *5/08*
U.S. Cl. 209—73 **19 Claims**



1. A method of conveying articles which comprises the steps of:

guiding the articles along a first portion of a path tangential to a rotatable member having notches spaced on the periphery thereof which substantially conform to at least a part of the outer configuration of the articles; and

moving the rotatable member to engage such part of each of the articles with one notch to space the articles from each other in accordance with the spacing of the notches, to support the articles in the notches and to controllably move the articles with the rotatable member along a second portion of the path adjacent to, and in alignment with, the first portion.

4,094,411

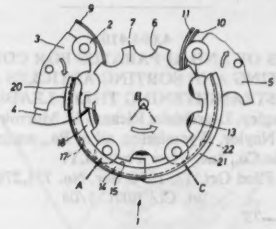
APPARATUS FOR CONVEYING UPRIGHT STANDING CONTAINERS AND REJECTING ABNORMAL CONTAINERS

Hermann Kronseder, Regensburger Strasse, Worth, Donau, Germany; Karl Dullinger, Neutraubling, Germany, and Kurt Matzinger, Regensburg, Germany, assignors to Hermann Kronseder, Worth, Donau, Germany

Filed Dec. 1, 1976, Ser. No. 746,275
Claims priority, application Germany, Dec. 13, 1975, 2556338
Int. Cl.[2] B07C *9/00*
U.S. Cl. 209—97 **15 Claims**

1. In apparatus for conveying upright standing containers on a curved path, said apparatus including a driven star wheel which advances containers in spaced relation along said path, said apparatus having a transfer point at the beginning of the curved path where containers are fed into the star wheel and a second transfer point at the end of the curved path where normal containers are discharged from the star wheel, the

improvement for rejecting abnormal containers laterally from the star wheel intermediate said transfer points and comprising a curved support rail on which the container rests and a curved guide rail spaced above the level of the said curved support rail to form in a spacing between the guide and support rails and intermediate said transfer points an abnormal container reject-



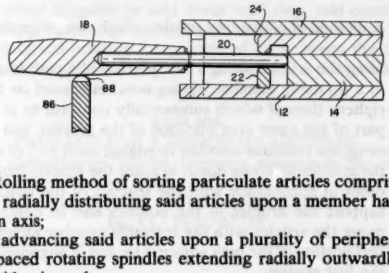
ing gap, said gap being longer than the container diameter and higher than the abnormal container, said rails being substantially concentric to the star wheel, said guide rail being disposed outside the path of that part of the container which bears against it by centrifugal force, whereby abnormal containers of a height less than said spacing will be rejected by centrifugal force through said gap.

4,094,412

ROLLING METHOD OF SORTING PARTICULATE ARTICLES

Kurt H. Hoppmann, Falls Church, Va., and George W. Edmunds, Derwood, Md., assignors to Hoppmann Corporation, Springfield, Va.

Filed Nov. 30, 1976, Ser. No. 746,024
Int. Cl.[2] B07C 5/04
U.S. Cl. 209—106 **22 Claims**



1. Rolling method of sorting particulate articles comprising:
(A) radially distributing said articles upon a member having an axis;
(B) advancing said articles upon a plurality of peripherally spaced rotating spindles extending radially outwardly of said axis, and
(C) discharging said articles from said spindles.

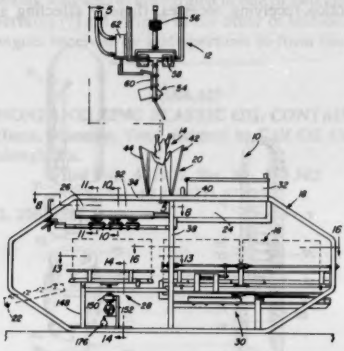
4,094,413

POULTRY WEIGHING AND PACKING METHOD

William F. Altenpohl, 1315 Robin Hood Rd., and Paul J. Altenpohl, 1411 Longcreek Dr., both of High Point, N.C. 27260

Division of Ser. No. 571,005, Apr. 22, 1975, Pat. No. 3,988,874.
This application Jun. 15, 1976, Ser. No. 696,391
Int. Cl.[2] B07B 13/08
U.S. Cl. 209—121 **9 Claims**

1. In combination with a sorting mechanism having a conveyor from which objects are suspended by a plurality of carriers and means for releasing sorted objects from the carriers at a sorting station, a container filling machine, including inlet means operatively positioned relative to the sorting station for receiving sorted objects released from the carriers, accumulator means connected to the inlet means for storing said objects, ram means for displacing each of the sorted objects received in the inlet means into the accumulator means to compact the same, and guide means connected to the inlet means for positioning each of the objects in a predetermined orientation relative to the ram means prior to said displacement into the accumulator means, said carriers being spaced from each other by a predetermined distance along a path of travel of the conveyor, and means responsive to unloading of the



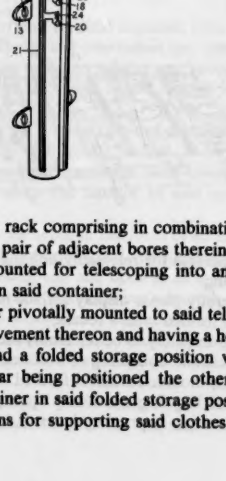
sorted objects from the carriers at said sorting station for delaying operation of the ram means until the unloaded carrier is advanced by the conveyor a predetermined distance from the sorting station to synchronize operation of the machine with movement of the conveyor.

4,094,414

CLOTHES HANGING RACK

Richard E. Thiot, and Phyllis J. Thiot, both of 4981 Cedar Bay St., Orlando, Fla. 32806

Filed Jun. 6, 1977, Ser. No. 803,544
Int. Cl.[2] A47F 7/24
U.S. Cl. 211—1.3 **9 Claims**



1. A clothes hanging rack comprising in combination:
a container having a pair of adjacent bores therein;
a telescoping rod mounted for telescoping into and out of one of said bores in said container;
a clothes hanging bar pivotally mounted to said telescoping rod for pivotal movement thereon and having a horizontal support positon and a folded storage position with said clothes hanging bar being positioned the other of said bores in said container in said folded storage position;
support bracket means for supporting said clothes hanging

bar in a generally horizontal position when said clothes hanging bar is in its working position; and

locking means for locking said telescoping rod in a telescoped position, whereby a foldable clothes hanging rack may be conveniently stored in a laundry room.

4,094,415

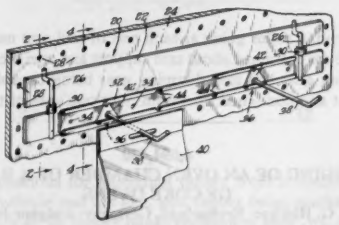
DISPLAY RACK DEVICE

Charles O. Larson, Sterling, Ill., assignor to Chas. O. Larson Co., Sterling, Ill.

Continuation of Ser. No. 372,411, Jun. 21, 1973, abandoned. This application Dec. 3, 1974, Ser. No. 529,154

Int. Cl.[2] A47F 7/00; A47B 96/06

U.S. Cl. 211—57.1 **9 Claims**



1. A display rack device for attachment to an apertured vertical panel, said device including a plurality of generally elongate arms each having a free extremity for telescopically accommodating goods for display purposes, mounting means associated with the opposite extremity of said arms and extending laterally thereof, an elongate horizontal support member extending substantially normal to said arms for accommodating a plurality of said mounting means in horizontally spaced relation, a plate to which the elongate support member is secured along the length thereof for attaching said elongate member to an apertured vertical panel and with the ends of the support member terminating short of the ends of the plate leaving plate end portions beyond each end of the support member, said plate having at least two longitudinally spaced apertures, one through each of said plate end portions and offset outwardly of adjacent ends of the support member to be placed in registry with two apertures of said apertured vertial panel, and rod means having a first bent portion for insertion through the aligned apertures of said plate and said apertured vertical panel and moved into position behind said apertured vertical panel, and a forwardly offset second bent portion to be placed over the front face of said plate end portions, and a resilient gripping finger formed as an integral part of each said plate end portion and extending forwardly from the front face thereof and presenting an open throat between the ends of the support member and the plate to receive the second bent portion of said rod means transversely across the plate end portions and spaced from adjacent ends of the support member for resiliently and removably securing it in place in direct surface contact against the front face of the plate end portions, thereby securing said plate and said support member to said apertured vertical panel.

4,094,416

SUPPORT FOR DISPENSING PACKAGES

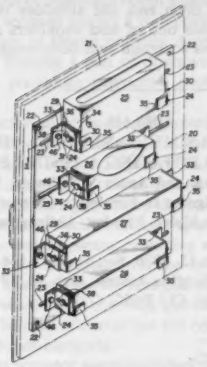
James A. Smith, 19 Donelon Dr., Harahan, La. 70123

Filed Apr. 29, 1977, Ser. No. 792,105

Int. Cl.[2] A47F 7/17

U.S. Cl. 211—71 **11 Claims**

1. A support for dispensing packages and the like comprising a panel body adapted for attachment to the interior of a cabinet door or the like, said panel body having at least one elongated adjustment slot formed therethrough across the panel body, and at least a pair of adjustable dispensing package holder units on one side of the panel body adjacent said slot, each holding unit adapted to engage one end portion of the dispensing package and each holding unit comprising first and second bracket parts, fastener means connecting each first bracket part adjustably with the panel body through said slot, slotted fastener means adjustably connecting said first and second bracket parts of each holder unit adjustably along an axis perpendicular to



the panel body, each first bracket part having a lower flange adapted to engage beneath opposite end portions of a dispensing package to support the package, and each second bracket part having a flange perpendicular to the last-named flange adapted to overlap a side wall of a dispensing package spaced forwardly of the panel body and in a plane parallel thereto.

4,094,417

SHELVING AND DISPLAY SYSTEMS AND THE LIKE

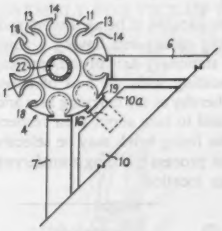
Denis Alan Cairnes, and Derrick John Maltby, both of London, England, assignors to Cairnes Maltby Associates Limited, London, England

Filed Jan. 24, 1977, Ser. No. 761,955

Claims priority, application United Kingdom, Jan. 29, 1976, 3618/76

Int. Cl.[2] A47F 5/00

U.S. Cl. 211—183 **9 Claims**



1. A bracket device for shelving systems, display systems and the like, comprising:

a body;

said body having a plurality of recesses disposed in and about the periphery thereof with the axes of said recesses being substantially parallel;

said recesses being opened at both ends of the body;

at least one support member for supporting an element of said systems from said body;

said support member comprising a body - engaging part and a projecting part;

said body-engaging part being slidable into a selected recess via either one of said open ends thereof with said projecting part projecting from the periphery of said body;

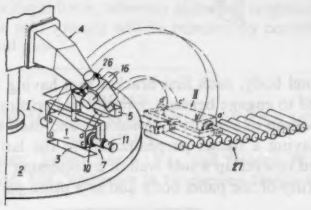
cooperating means on said body-engaging part and said body for retaining said support member in position when said support member is inserted into said recess, said cooperating means including shoulders on said body-engaging part and said body, each recess in the body having one of said shoulders adjacent each open end thereof, whereby when said body-engaging part is inserted into a selected recess via either open end, the shoulder on the body-engaging part abuts one of said shoulders adjacent the ends of said recess to retain said body-engaging part in said recess.

4,094,418

APPARATUS FOR SIMULTANEOUSLY PIVOTING, TILTING AND ROTATING A LINING BRICK

Alois Altendorfer, Linz, and Anton Stahrlinger, Stadl Paura, both of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Oct. 13, 1976, Ser. No. 732,144
Claims priority, application Austria, Oct. 20, 1975, 7947/75
Int. Cl.² B65G *47/90*
U.S. Cl. 214—1 BC **6 Claims**



1. An apparatus for simultaneously pivoting, tilting and rotating a lining brick, in particular a converter lining brick having a trapezoidal cross-section, into a position adequate for stacking comprising

a stationary supporting stand,

a carrying arm journaled on the stationary supporting stand to be pivotable around a stationary axis,

a bracing means for holding the lining brick journaled on one end of the carrying arm to be rotatable around an axis that is skew relative to the stationary axis of the carrying arm, and

a planet gear capable of being disengaged provided to rotate the bracing means and having a central axis coinciding with the stationary axis of the carrying arm and an orbit axis coinciding with the axis of rotation of the bracing means whereby as the carrying arm and bracing means are each caused to turn about their respective axis by a drive means, the lining brick may be selectively turned end for end in the process of being transferred from one location to another location.

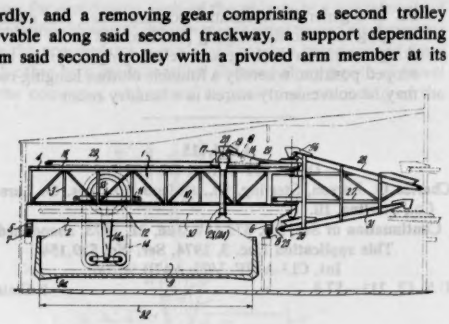
4,094,419

HANDLING PLANT FOR DUMPING AND DISCHARGING BULK MATERIALS

Rolf Krüger, Lubeck, Germany, assignor to O and K Orenstein & Koppel Aktiengesellschaft, Germany

Filed Oct. 12, 1976, Ser. No. 731,669
Claims priority, application Germany, Oct. 18, 1975, 2546757
Int. Cl.² B65G *65/28*
U.S. Cl. 214—10 **9 Claims**

1. A handling plant for dumping and discharging bulk material into or from a pile, comprising only one loading bridge adapted to span and be moved over the pile, said bridge having first and second support beam portions extending longitudinally of said bridge, each having a respective first and second trackway thereon, a dumping gear comprising a first trolley movable along said first trackway and having conveyor means for receiving the bulk material and for dumping it downwardly, and a removing gear comprising a second trolley movable along said second trackway, a support depending from said second trolley with a pivoted arm member at its



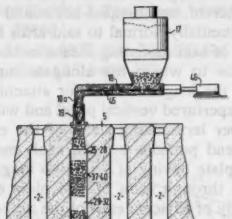
lower end, a roller guide at each end of said arm member and a conveyor entrained about said support and arm member, said removing gear and said dumping gear being capable of independent and combined operation over one area of the pile.

4,094,420

CHARGING OF AN OVEN CHAMBER OF A BATTERY OF COKE OVENS

Johann G. Riecker, Breitscheid, Germany, assignor to Hartung, Kuhn & Co., Dusseldorf, Germany

Division of Ser. No. 563,115, Mar. 28, 1975, abandoned. This application Jun. 10, 1976, Ser. No. 694,522
Claims priority, application Germany, Apr. 3, 1974, 2416151
Int. Cl.² C10B *31/02*
U.S. Cl. 214—35 R **5 Claims**



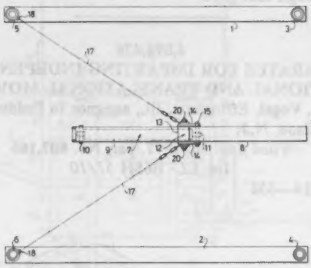
1. An apparatus for charging an oven chamber of a battery of coke ovens with coal through charging openings in an oven roof, comprising a larry car movable over said oven roof and provided with coal feed hoppers each having an outlet hole, said hoppers corresponding in number of said openings in said oven roof; and conveying means adapted for conveying said coal from each of said hoppers into said oven chamber, said conveying means including a plurality of pipes each operative for connecting one of said outlet holes of said hoppers with one of said charging opening in said oven roof, and a plurality of conveyor screws each located in one of said pipes and rotatable about its own longitudinal axis, each of said conveyor screws having a leading end as considered in the direction of coal conveying and is provided at said leading end with an extension configurated as a hollow cylindrical segment, said cylindrical segment being rigid with and in a fixed position relative to the respective conveyor screw for joint rotation therewith about said axis, said hollow cylindrical segment being adapted to close an associated one of said charging openings in said oven roof during a part of each revolution of the respective conveyor screw, so as to intermittently charge the coal from said outlet hole of said hopper into the corresponding opening of the oven roof.

4,094,421

DEVICE FOR UNLOADING OF TIMBER

Bengt Anders Nordin, Tåsjö-Lövvik, Hoting, Sweden

Filed Oct. 29, 1976, Ser. No. 736,933
Claims priority, application Sweden, Nov. 3, 1975, 7512271; Sep. 24, 1976, 7610613; Sep. 24, 1976, 7610614
Int. Cl.[2] B60P *1/00*
U.S. Cl. 214—82 4 Claims



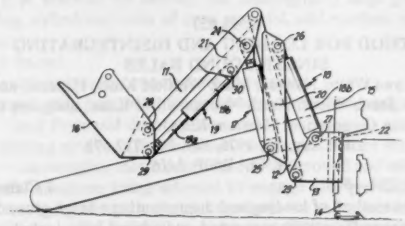
1. An apparatus for unloading timber from a loading platform of a vehicle and the like, said timber being stacked on a support such as, on timber bunks between at least two stationary stakes at one side of said platform and at least two removable stakes at the other side thereof, said apparatus comprising: a linearly reciprocating prime mover defined by a hydraulic jack enclosed in a non-circular tube extending beyond said jack and is provided with two longitudinal slots in two opposing side faces, said slots forming a guide for a slide member, and being secured to said platform beneath said said support, extending perpendicularly relative to said platform sides and centrally between said stationary stakes, and at least two elongated flexible members, each having a first end secured to each one of said stationary stakes at a distance upward from said support, the second end of each of said elongated members being attached to said prime mover through said slide member for lateral displacement of said platform upon reciprocation of said prime mover, whereby said elongated members which normally are loosely disposed along said stationary stakes and pass in under said stacked timber, are caused to be tensioned, as said second ends are laterally displaced, thereby forming a sloping ramp along which said timber moves down from said support.

4,094,422

BUCKET LOADER BOOM

Arthur David Thompson, Chorley, England, assignor to Dobson Park Industries Limited, Nottingham, England

Filed Sep. 20, 1976, Ser. No. 724,639
Claims priority, application United Kingdom, Oct. 7, 1975, 41111/75
Int. Cl.[2] E02F *3/81*
U.S. Cl. 214—145 R 7 Claims



1. A protective type of boom structure for the actuator means in a bucket loader which is particularly adapted for low headroom mine workings comprising:

a yoke having at least limited pivotal motion about a generally vertical axis,

two articularly connected boom elements pivotally coupled to said yoke, one a remote or forward boom element and one a yoke or rearward boom element, each comprised of channel sections having a web portion forming a top wall and a pair of flange portions depending from said web portion forming a pair of downward inclined side walls thereby providing respective protected interior spaces therein,

a piggy-back channel section mounted forwardly on the top of said rearward boom element, also having a web portion forming a top wall and a pair of flange portions depending therefrom forming a pair of downward inclined side walls meeting the web portion of the boom element providing yet another protective interior space therein,

first ram actuation means extending along and at least partially within the interior space of said rearward boom element and between the rear end portions of said forward and rearward boom elements and being connected thereto so as to be operable to adjust the relative angular position of said boom elements,

second ram actuator means coupled at one end to said yoke and extending into said yet another protective interior of said piggy-back channel section and coupled at its other end to the forward portion thereof and being operable thereby to raise and lower the boom structure, and

third ram actuator means extending along and at least partially within the interior space of said forward boom element being coupled at one end to the bucket loader and its other end to a selected portion of said forward boom element and being operable to adjust the angular position of the bucket loader relative to said rearward boom element,

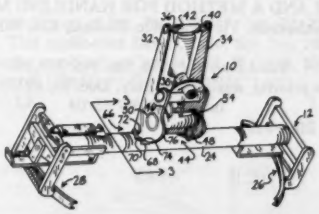
said channel sections thereby not only protecting the respective ram actuator means against mechanical damage but said web portions thereof being additionally able to protect the ram actuator means from overhead spoil in said mine working which may foul the ram actuator means and thus render them inoperable.

4,094,423

TILTING ASSEMBLY FOR PICK-UP HEAD

James Rogers, P.O. Box 2011, Haines City, Fla. 33844

Filed Jan. 31, 1977, Ser. No. 764,430
Int. Cl.[2] B65G *67/46*
U.S. Cl. 214—147 G 8 Claims



1. An orienting assembly of the type primarily designed for use in positioning a boom supported pick-up head having a rotary shaft, said orienting assembly comprising:

frame means pivotally connected to the pick-up head in supporting relation thereto, said frame means disposed in movably interconnected relation between the head and the boom;

activating means disposed in driving, movable interconnection to the pick-up head;

lever means having at least a portion thereof fixedly attached

to said rotary shaft of said pick-up head and movably connected in driven relation to said activation means;

attachment means including a pivot shaft rotatably connected to said frame means and disposed for supported attachment to the boom, whereby the head is pivotable relative to said frame means upon operation of said activation means;

said frame means comprising at least two mounting plates rotatably mounted on said pivot shaft and each disposed in spaced apart relation to one another and in at least partially surrounding relation to said activation means; and

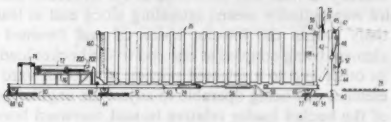
stabilization means mounted on said rotary shaft in sliding engagement with a peripheral edge portion of at least one of said mounting plates, said stabilization means correspondingly configured to at least a portion of the length of said peripheral edge, said one mounting plate biased into stabilized position upon mating engagement between said correspondingly configured peripheral edge and said stabilization means.

4,094,424

REFUSE CONTAINER DISCHARGE STATION

Samuel E. Harvey, Knoxville; James Stephen Whitehead, Maryville, and Paul L. Goranson, Knoxville, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,524
Int. Cl.[2] B65G *69/22*
U.S. Cl. 214—304 **10 Claims**



1. A refuse container unloading apparatus for discharging material from a transportable refuse container, comprising:

carriage means for supporting a removable container during unloading thereof, the carriage means being movable longitudinally thereof between a container receiving position and a container refuse unloading position;

positioning means connected to the carriage means for moving the carriage means between said positions, the positioning means including a deceleration means for slowing inertial movement of the carriage means; and

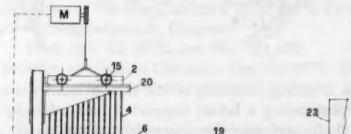
ejection means for discharging refuse from said container when the carriage is in the unloading position.

4,094,425

DEVICE AND A METHOD FOR HANDLING MATERIAL

Franco Gabbrielli, Via Reginaldo Giuliani, 126, 50141-Firenze, Italy

Filed Dec. 10, 1976, Ser. No. 749,265
Claims priority, application Italy, Dec. 24, 1975, 9663 A/75
Int. Cl.[2] B65G *65/04*
U.S. Cl. 214—310 **11 Claims**



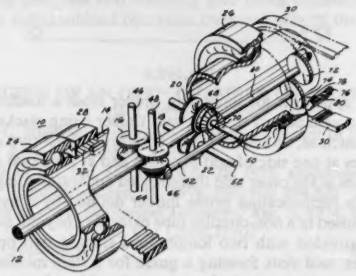
1. A material handling device comprising a roller conveyor component having rollers which are separated by gaps; a cage component which includes rows of uprights, the spacing and the thickness of the uprights in each row being such as to permit their insertion into said gaps and their movement through said gaps; crosspieces interconnecting the uprights of one row only with corresponding uprights of other rows, said crosspieces extending parallel to the axes of said rollers and being insertable in said gaps means for effecting relative movement between said cage and said conveyor perpendicularly to each other such that said uprights and said crosspieces can move through said gaps.

4,094,426

APPARATUS FOR IMPARTING INDEPENDENT ROTATIONAL AND TRANSLATIONAL MOVEMENT

Charles A. Vogel, Effingham, Ill., assignor to Fedders Corporation, Edison, N.J.

Filed Jun. 16, 1977, Ser. No. 807,165
Int. Cl.[2] B65H *51/10*
U.S. Cl. 214—338 **9 Claims**



1. Apparatus for imparting independent rotational and axial movements to a workpiece and combining such movements, including

(a) first means to impart rotational movement to the workpiece in a first direction and rotational movement to the workpiece in a second direction opposite to said first direction;

(b) second means to impart axial movement to the workpiece in a first axial direction transverse to the direction of rotation of the workpiece and in a second axial direction opposite to said first axial direction;

(c) first timing means for said first means to control the rate of rotation of the workpiece;

(d) second timing means independent of said first timing means to control the rate of axial movement of the workpiece; and,

(e) common means intercoupling said first and said second means and responsive thereto for simultaneously imparting the rotational and the axial movement to the workpiece, said common means being independently controlled by said first and said second means for independent axial and rotational movement of the workpiece.

4,094,427

METHOD FOR LOADING AND DISINTEGRATING SINGLE ROUND BALES

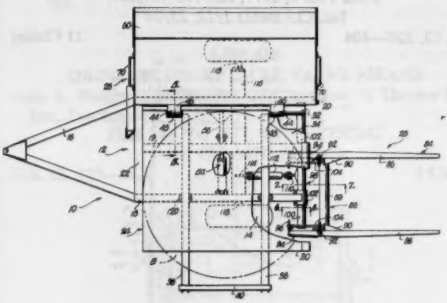
Bruce Lynn White, Newton; Mark Winfield Kiner, Hesston, and Arlen Jacob Wiens, North Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 25, 1976, Ser. No. 717,672
Int. Cl.[2] B60P *1/16*
U.S. Cl. 214—505 **3 Claims**

1. The method of loading and disintegrating a large ground-lying, circumferentially supported, cylindrical bale, including the steps of:

engaging the circumference of said ground-lying bale from one end thereof;

swinging said bale in a first upright plane to an elevated, substantially horizontal support surface;
end-supporting said bale on said surface in a stationary position with the axis of the bale vertically disposed;
subsequently swinging said bale in a second upright plane from said position toward an upstanding zone of disintegration;



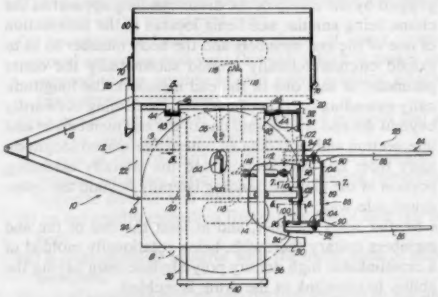
progressively shredding said bale in said zone while continuing to swing the bale in said second plane whereby the bale is disintegrated obliquely thereof; and
retaining said bale against movement away from said zone until completely disintegrated.

4,094,428

METHOD AND APPARATUS FOR LOADING AND DISINTEGRATING SINGLE ROUND BALES

Bruce Lyan White, Newton; Mark Winfield Kiner, Hesston, and Arlen Jacob Wiens, North Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 717,672, Aug. 25, 1976. This application Feb. 22, 1977, Ser. No. 770,637
Int. Cl.² B60P *1/16*
U.S. Cl. 214—505 **13 Claims**



1. A machine for loading and disintegrating large ground-lying, cylindrical bales of crop material, said machine including:
a frame;
a disintegrator supported on said frame;
a normally horizontal feeding bed on the frame swingable to and from said disintegrator; and
loading structure pivotally mounted on said frame for vertical swinging movement between the ground and said bed,
said structure being adapted to engage said ground-lying, cylindrical bale and stand the latter on end upon said bed whereupon the bales are forcibly fed end-first into said disintegrator by swinging movement of the bed toward the disintegrator,
said bed having a substantially flat support surface and being pivotally secured along one edge to said frame adjacent said disintegrator,
said support surface being disposed below said disintegrator when said bed is in its horizontal position,
said bed including support means opposite said one edge and extending above said support surface for retaining said bales on said bed during swinging movement to said disintegrator.

4,094,429

STOPPER FOR TEST TUBE, AND THE LIKE

Matthew C. Urbin, 4524 La Barca Dr., Tarzana, Calif. 91364

Filed Jul. 26, 1976, Ser. No. 708,402
Int. Cl.² B65D *41/00*
U.S. Cl. 215—305 **4 Claims**

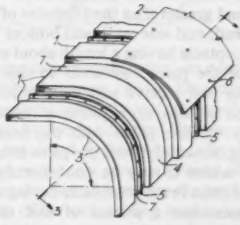
1. A stopper for sealing the mouth of a test tube, and the like, said stopper being formed of a resilient material, and having a hat-shape with a closed outer end and an open inter end, and having a peripheral rim surrounding said open inter end and dimensioned to engage the edge surrounding the mouth of the test tube in which the wall of the stopper tapers from a thicker to a thiner dimension from the closed end of the stopper to said peripheral rim and with the central portion of the stopper being adapted to be pushed inwardly into the mouth of the test tube to assume an inside-out configuration in sealing relationship with the inner wall of the test tube adjacent to the aforesaid edge.

4,094,430

CARGO CONTAINER

John F. Cauley, 847 Montgomery Drive, Ancaster, Ontario, Canada

Continuation-in-part of Ser. No. 570,949, Apr. 22, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 748,918
Claims priority, application Canada, Jul. 15, 1974, 204749
Int. Cl.² B65D *87/00, 7/44;* E04C *1/10*
U.S. Cl. 220—1.5 **2 Claims**



1. In a cargo container having a bottom, end, and side walls, and a top wall or roof, connected to said side and end walls, an

improved connection between said side walls and the top wall comprising

a plurality of continuous grooved metal sheets connected to and extending from each said side wall and curving to extend across the top of the container and defining a smooth, long radius corner, said grooved sheets extending transversely of the longitudinal axis of the container;

each sheet having at least one flat trough part and a parallel, adjacent flat top part joined to said trough part by flat side walls extending ninety degrees to said trough part and top parts, and a raised lip seam longitudinally and continuously formed with the length of the sheet;

each sheet being joined to an adjacent sheet by said lip seam;

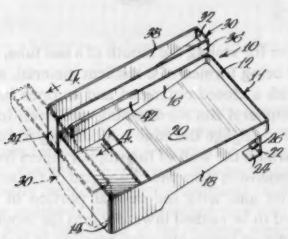
in combination with a curved metal reinforcing edge strip contoured in cooperation with said long radious corner and extending parallel to said longitudinal axis along the upper corner between the side and top walls of the container; said edge strip overlying and being secured to the flat top parts of the grooved sheets defining a box section with the trough parts of the grooved sheets to thereby strengthen the grooved sheets both longitudinally with the length of the container and laterally about said radious corner in a direction transverse to said axis of said container.

4,094,431

PAINT TRAY WITH BRUSH HOLDING ATTACHMENT

William A. Wheeler, 352 Jefferson St., Glencoe, Ill. 60022

Filed Feb. 2, 1976, Ser. No. 654,410
Int. Cl.[2] B44D *3/12*; B65D *21/02*
U.S. Cl. 220—23.4 **8 Claims**



1. An assembly for simultaneously accommodating a paint roller and a conventional paint brush for painting the walls and ceiling of a dwelling, said brush having a handle with an aggregation of bristles extending longitudinally therefrom at one end thereof, said aggregation of bristles having a lateral width several times greater than its thickness, comprising:

a paint tray having a bottom wall which has an incline for at least a part of its length, a front wall, a back wall and a pair of side walls, together defining a receptacle for receiving a paint roller;

a paint brush receptacle havng a front wall, a back wall, a pair of side walls, and a bottom wall, the distance between said side walls of said paint brush receptacle being less than the width of said paint brush at said bristled end thereof and greater than the thickness of said brush at said bristled end, said side walls and bottom wall of said paint brush receptacle having a length about equal to the length of one of the paint tray walls so that said paint brush receptacle will receive said paint brush with the wider dimension of said aggregation of bristles inserted in a generally verticle plane with the handle of the brush extending outwardly from the paint brush receptacle in a position where it may be conveniently grasped by the user, said paint brush receptacle having a length sufficient to accommodate a second of said conventional paint brushes oriented in the same vertical plane; and

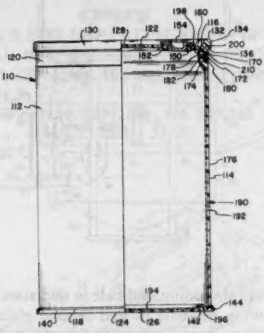
clamp means secured to said paint brush receptacle for removably attaching said paint brush receptacle to a wall of said paint tray, said paint brush receptacle being attachable to either of said side walls of said paint tray and also being attachable to said back wall of said paint tray.

4,094,432

INDUSTRIAL DRUMS

Seymour Zilbert, Demarest, N.J. Assignors to Bergen Barrel & Drum Co., Demarest, New Jersey

Filed Feb. 9, 1977, Ser. No. 767,137
Int. Cl.[2] B65D *1/12, 25/14*
U.S. Cl. 220—404 **21 Claims**



1. An industrial drum constructed of synthetic resin material and capable of being gripped by a clamp of a drum-handling apparatus to facilitate mechanized handling of the drum, said drum comprising:

a generally tubular body member extending longitudinally between opposite ends and including a cylindrical side wall;

first and second end members, at least one of which is unitary with the tubular body member at one end thereof and closes said one end, the first and second members each including a circular end wall; and

at least one chime molded unitary with a member of the drum, the chime having a configuration including portions extending longitudinally and laterally outwardly for being gripped by the clamp of the drum-handling apparatus, the chime being annular and being located at the intersection of one of the end members and the body member so as to extend circumferentially around substantially the entire perimeter of said one of the end members, the longitudinally extending portion of the chime extending outwardly beyond the end wall of said one of the end members at said intersection and including an outer edge spaced longitudinally from said intersection, and the laterally extending portion of the chime extending laterally beyond the cylindrical side wall;

the tubular body member, and at least the one of the end members unitary therewith, being rotationally molded of a crosslinkable high density polyethylene resin having the ability to crosslink as the drum is molded.

19. For use in an industrial drum having a generally tubular body member extending longitudinally between opposite ends, first and second end members, one of which is unitary with the tubular body member at one end thereof and closes said one end, an external thread integral with the other of the ends of the tubular body member, and an internal thread on the other of the end members, said internal thread being generally complementary to the external thread, the improvement comprising:

a cupped liner of relatively rigid synthetic resin material for reception within the tubular body member, said cupped liner having

a tubular wall complementary to the tubular body member;

a closed end complementary to the unitary end member;

an opposite open end; and

a lip at the open end of the liner, said lip including an annular

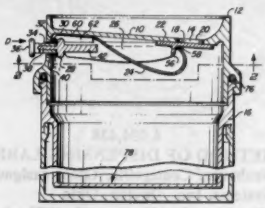
portion turned longitudinally back toward the closed end and spaced laterally outwardly from the tubular wall of the liner, said annular portion being in the form of a thread complementary to the external thread of the tubular body and the internal thread of the other of the end members for reception interjacent the external thread and the internal thread when the liner is in place within the drum and said other end member is threaded onto the tubular body member.

4,094,433

DRINKING RECEPTACLE VALVE MEANS

Jody L. Numbers, Scottsdale, Ariz., assignor to Thermo-Seal, Inc., Los Angeles, Calif.

Filed Jan. 14, 1977, Ser. No. 759,142
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.4 **2 Claims**



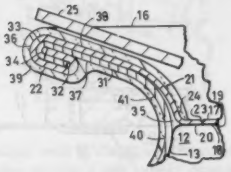
1. In a drinking vessel of heat-insulating material:
(a) a receptacle;
(b) a cover for said receptacle, said cover including a top wall formed with a dispensing opening and a cylindrical wall depending from said top wall and formed with a pneumatic vent;
(c) a valve for said dispensing opening in the form of a flat plate in sealing engagement with a valve seat on the underside of said cover about said dispensing opening;
(d) a valve actuator integral with said dispensing valve and having a portion extending through said vent;
(e) a retainer flange on said actuator spaced from the inner surface of said cylindrical wall;
(f) an O-ring seal between said retainer flange and said inner surface of the cylindrical wall;
(g) an operating knob having a shank of lesser cross-sectional area than said vent through which it passes and is secured to the portion of said valve actuator which extends through said vent;
(h) a bar portion integral with said valve actuator and adjacent to said O-ring retainer flange;
(i) a pair of spaced-apart rail members each having an end integral with said bar portion and extending therefrom on opposite sides of said valve actuator;
(j) an outwardly extending flange on each of said rail members;
(k) a cross member integral with the other ends of said rail members;
(l) a leaf spring having an end portion secured to the underface of said cover and an intermediate bowed portion depending from the cover with the other end of the spring being secured to said dispensing valve, whereby said spring biases the dispensing valve into sealing position on said valve seat and the O-ring into sealing position relative to said vent; and
(m) a pair of cams depending from said cover on opposite sides of said valve actuator and passing through recesses in the flanges on said rail members, each of said cams having a cam surface that is normally spaced from that portion of a flange on one of said rail membes which it confronts but which is engaged by said flange on said rail member after the valve actuator has been moved inwardly from the cylindrical wall of said cover a distance sufficient to open said pneumatic vent whereupon the engagement of said rail member flanges with said cam surfaces causes the valve actuator to move the valve for said dispensing opening into a position in which said dispensing opening is open.

4,094,434

DISPOSABLE CONTAINER FOR HEATABLE FOOD PRODUCTS

William A. Coiner, 101 S. Indian Cir., Cocoa, Fla. 32922

Filed Dec. 13, 1976, Ser. No. 749,888
Int. Cl.[2] A47G *19/22*; B65D *25/28*
U.S. Cl. 220—90.6 **2 Claims**



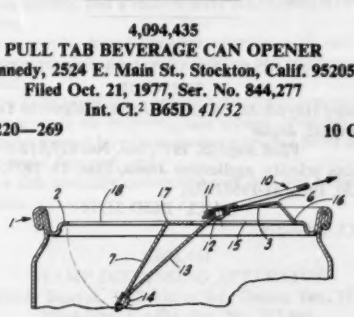
1. A disposable container for a heatable food product comprising a metal body that defines an hermetically sealed chamber for the food product, said body having upper and lower ends and being adapted at its lower end for placement on a stove or other heat source, an annular lip and a removable closure at said upper end, said closure having a perimeter and being surrounded at said perimeter by said lip, said lip being arranged to project above the perimeter of the closure and having oppositely facing surfaces, and insulating means covering said oppositely facing surfaces for protecting the lips of a consumer of the container contents from heat transmitted to said oppositely facing surfaces, said body having a peripheral side wall section with an annular recess portion that surrounds the closure at said upper end, said annular recess portion having an outer surface that merges with one of said oppositely facing surfaces, said recess portion being adapted to receive fingers of a person manipulating said container, and said insulating means additionally covering said outer surface of the annular recess portion for protecting such fingers of the person from heat transmitted to said outer surface.

4,094,435

PULL TAB BEVERAGE CAN OPENER

Clyde Kennedy, 2524 E. Main St., Stockton, Calif. 95205

Filed Oct. 21, 1977, Ser. No. 844,277
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 **10 Claims**



1. A beverage can opener comprising—in combination with the top of a metallic beverage can—a hinged-end tear strip defined on said top by scoring thereof, a hinged-end tear flap defined on said top by scoring thereof, the tear strip and tear flap being spaced but alined on the can top, a finger-engageable pull tab connected to the tear strip exteriorly of the can top, and a tension strap connected between the tear strip and the tear flap internally of the can; pulling motion on the pull tab severing said tear strip, except at one end providing a hinge, from the can top whereby a vent is formed in said can top, and such motion—at the same time and as a transmitted force imposed by the tension strap on the tear flap—severing said

tear flap, except at one end providing a hinge, from the can top and bending such tear flap into the can, thus producing a drinking and pouring opening in the can top.

4,094,436

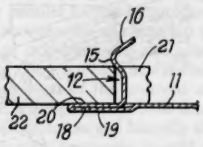
APERTURE PLUG

Douglas William Birmingham, Ickenham, England, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 543,087, Jan. 22, 1975, abandoned. This application Oct. 21, 1976, Ser. No. 734,490

Int. Cl.[2] B65D *45/16, 45/00*

U.S. Cl. 220—315 **7 Claims**



1. A one-piece plug for a panel aperture comprising a plate member having a flat, planar inside face portion, a peripheral edge and a plurality of resilient legs which depend from said plate member from the inside face portion side thereof adjacent said peripheral edge, said plate member having a plurality of spaced recesses embossed on the inside face thereof and adjacent each leg and said peripheral edge, said legs being formed by extensions of the plate member, each leg having: a first portion integrally joined to said peripheral edge which is folded back onto the inside face portion of said plate member and is positioned within said recesses and abutting the bottom of said recesses so as to lie substantially flush with and substantially in coplanar relationship with the said inside face portion of said plate member, each of said recesses having a width substantially equal to said first portions of said legs, a second portion which extends substantially at right angles to said plate member, and a third portion extending from said second portion, said third portion including a retaining part and an inwardly inclined lead-in part, said second and third portions of each of said legs projecting from the plate member at a position radially inwardly of said peripheral edge thereby leaving said peripheral edge of said plate member unbroken.

4,094,437

CAP ASSEMBLY AND METHOD FOR PRODUCING THEREOF

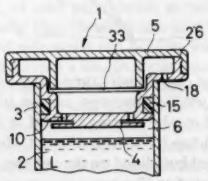
Yoshihiro Hayashida, Chigasaki, Japan, assignor to Tokico Ltd., Kawasaki, Japan

Filed Aug. 25, 1977, Ser. No. 827,812

Claims priority, application Japan, Mar. 19, 1977, 52-30771; Aug. 30, 1976, 51-116029[U]

Int. Cl.[2] B65D *51/16*

U.S. Cl. 220—374 **15 Claims**



1. A cap assembly for the reservoir of a vehicular brake comprising a cap body and a cap cover, said cap body a bottom being provided with a vent hole communicating between the interior of said reservoir and an air space, including a first cylindrical portion adapted to be received in the opening of said reservoir, a flange integrally formed with and radially and outwardly extending from said first cylindrical portion and having a vent hole communicating between said air space and the exterior of said reservoir radially and outwardly of said opening of the reservoir and a second cylindrical portion extending from the side of said flange opposite from the side of the flange adjacent said first cylindrical portion; and said cap cover including a third cylindrical portion fitted on said second cylindrical portion of the cap body and closed at one end; said second and third cylindrical portions having mating radial concave and convex engaging means and said closed end of the third cylindrical portion covering said second cylindrical portion of the cap body to thereby close said opening of the reservoir.

4,094,438

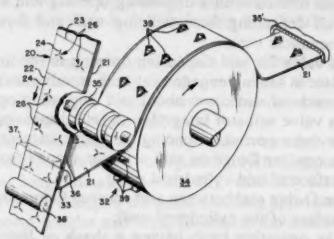
METHOD OF DISPENSING LABELS

Gilbert A. Neubauer, Centerville, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 604,290, Aug. 13, 1975, abandoned. This application Apr. 11, 1977, Ser. No. 786,312

Int. Cl.[2] B32B *3/10*

U.S. Cl. 221—1 **6 Claims**



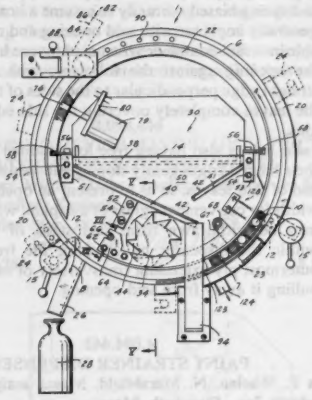
1. Method of dispensing labels, comprising the steps of: providing a plurality of labels releasably secured by pressure sensitive adhesive to a longitudinally extending web of supporting material, the web having cut means disposed at longitudinally spaced apart locations, each cut means including three slits arranged in a generally Y-shaped configuration and spaced apart by a frangible portion, each slit of the cut means being inclined with respect to the transverse direction across the web, one of the slits of each cut means extending generally longitudinally, each spaced apart cut means forming a respective generally V-shaped flap portion extending initially in the plane of the web, causing the web to undergo a sharp change in direction at a delaminating zone where labels are successively delaminated from the web, the web being oriented such that the flap portions extend in the upstream direction as the web travels toward the delaminating zone, bringing a driver having a plurality of teeth into contact with the web downstream of the delaminating zone to cause each tooth to press against portions of the web adjacent the respective slit to fold said adjacent web portions out of the plane of the web, to open a hole in the web, to sever the respective frangible portion and to fold the respective flap portion out of the plane of the web about a respective fold line and to drivingly engage the flap portion, and pulling on the delaminated part of the web by advancing the toothed driver to effect label delamination at the delaminating zone.

4,094,439

ARTICLE APPORTIONING APPARATUS HAVING A ROTATABLE DRUM

Hans List, Laustrasse 51, 7 Stuttgart 70 BRD, Germany

Filed May 10, 1976, Ser. No. 684,631
Claims priority, application Germany, May 9, 1975, 2520685; Nov. 13, 1975, 2550987
Int. Cl.[2] B23Q 7/12
U.S. Cl. 221—9 17 Claims



1. An apparatus for handling a multiplicity of like bodies, said apparatus comprising:

a housing;

a drum rotatable in said housing about a horizontal axis and having a multiplicity of inwardly open pockets arranged in circumferentially extending axially spaced rows and each dimensioned to hold one of said bodies;

a pair of axially spaced end walls in and axially closing said drum and defining therewith a separating space;

connectors extending axially between and axially securing together said end walls;

means for rotating said drum about said axis in a predetermined rotational sense relative to said end walls and to said housing;

input means for feeding a multiplicity of said bodies in random fashion into said space at a given input location therein;

end bolts extending axially between said end walls;

guide plates inclined downwardly at said input location and receiving said bodies from said input means;

a separating comb having a plurality of arcuate elongated separating elements defining a plurality of parallel slits and at least one rod extending transversely to and rigidly secured to said separating elements, said rod being held on and extending axially between said end walls;

means for joint sliding of said end walls, connectors, and comb axially out of said drum and out of said housing;

means including a pair of axially spaced hooks on said comb engageable over said rod for releasably securing said comb to said end walls in a position generally below said axis in said space downstream relative to said rotational sense from said location and with said slits each aligned with a respective one of said rows;

means for removing said bodies from said pockets at a removal location located downstream of said comb relative to said rotational sense; and

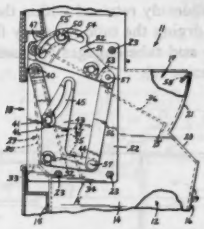
shields closely juxtaposed with said drum and fixed to said housing in such positions that said bodies cannot fall out of said pockets between said input location and said retrieval location, said shields having formations constituting said means for joint sliding.

4,094,440

SAFETY DOOR MECHANISM

Joseph A. Lotspeich, Eagan, Minn., assignor to Gross-Given Manufacturing Company, St. Paul, Minn.

Filed Sep. 23, 1976, Ser. No. 725,881
Int. Cl.[2] G07F 11/00
U.S. Cl. 221—12 9 Claims



2. In combination with a dispensing machine including a dispensing chamber having a top supply opening and a front delivery opening, a safety door mechanism comprising:

(a) a delivery door pivoted about a horizontal axis near the top of the delivery opening and normally positioned by gravity to close the delivery opening;

(b) a supply door pivoted about a horizontal axis near the front of the supply opening and normally positioned by gravity to clear the supply opening, said supply door depending behind said delivery door; and

(c) linkage means interconnecting said supply and delivery doors for closing said supply door in response to opening movement of said delivery door at a closing rate which initially exceeds the opening rate of said delivery door, so that said supply opening is substantially closed before said delivery opening is substantially open; said linkage means comprising a pair of linkage mechanisms, one of said mechanisms interconnecting said doors at each side of said dispensing chamber, wherein each of said linkage mechanisms comprises:

(i) a delivery door lever arm pivoting with said delivery door and having a first drive pin adjacent its free end;

(ii) a bell crank having a fixed center pivot, a first lever arm containing an arcuate slit receiving said first drive pin therein, and a second lever arm having a first pivot pin;

(iii) a supply door lever arm pivoting with said supply door and having a second drive pin adjacent its free end;

(iv) a fixed pivot lever having a first lever arm containing an arcuate slit receiving said second drive pin therein, and a second lever arm having a second pivot pin adjacent its free end; and

(v) a link pivotally connecting said first and second pivot pins.

4,094,441

STAMP DISPENSING APPARATUS

Daniel Davis Warren, 7317 Fisher Rd., Dallas, Tex. 75214

Filed Nov. 1, 1976, Ser. No. 737,464
Int. Cl.[2] B65H 7/18
U.S. Cl. 221—18 10 Claims

8. Apparatus for dispensing stamps, having a housing including therein,

(a) a magazine for containing and positioning at least one row of a stack of stamps, said magazine comprising more particularly

(i) means for urging the stamps toward the suction means (b),

(ii) pawl and cog means providing unidirectional movement of stamps in said magazine toward the suction means (b) herein, and

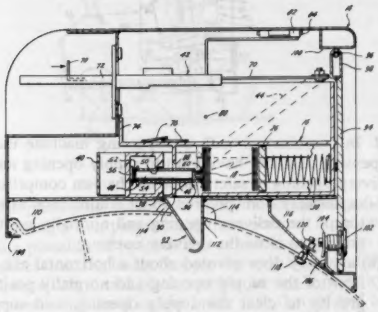
(iii) yieldable retention means for retaining stamps in the magazine but yieldable so as to release a stamp therefrom upon attachment of the suction means (b) herein to said stamp,

(b) suction means for releasably attaching to a stamp and withdrawing said stamp from the magazine (a), said means comprising,

(i) a support slideable within the housing,

(ii) a tube slideably retained within the support (i), and

(iii) means urging the tube (ii) away from the support (i) whereby said tube engages by suction a stamp within the magazine (a),



(c) coin actuated means for sliding the support (i) of the suction means (b) within the housing,

(d) means for preventing actuation of the coin actuated means (c) upon insertion of a coin in the apparatus when the stamps in the magazine (a) are exhausted,

(e) means for releasing a stamp from the suction means (b) comprising a wall within the housing having a portal through which the tube (ii) of the suction means (b) passes such that upon contact with the wall by a stamp in suction engagement with said tube, the stamp is released from the tube, and

(f) a chute for gravitationally receiving a stamp upon release thereof from the suction means (b).

4,094,442

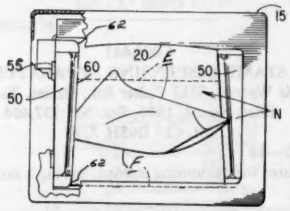
NAPKIN DISPENSER

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Continuation-in-part of Ser. No. 667,161, Mar. 15, 1976, abandoned. This application Apr. 13, 1977, Ser. No. 787,170

Int. Cl.[2] B65H *1/26*

U.S. Cl. 221—59 **5 Claims**



1. A napkin dispenser for a stack of folded napkins each folded in multiple plies having a final rectangular contour, with the outermost lifting ply terminating in a straight edge extending across the width of the folded napkin along a line parallel to the top and bottom edges thereof, comprising

(a) a parallelepiped container having a rectangular end wall of the approximate dimensions of said folded napkins and four side walls fixed thereto,

(b) an ingress-egress wall secured to the sidewalls opposite said end wall and having a generally rectangular opening therein for leading and dispensing napkins into and out of the container,

(c) a spring loaded follower within the container normally urging napkins within said container toward said opening,

(d) a pair of relatively narrow leaves having a longitudinal edge hingedly mounted on opposite sides of said opening and spring biased normally to assume a horizontal position generally coplanar with said opening and resiliently rotatable into said container when napkins are inserted through the opening against the follower, with the lifting ply straight edge perpendicular to the sides of the opening and the leaves completely covering the side edges of the napkins,

(e) said leaves also having free longitudinal edges opposite their hinged edges gently sloping substantially from end to end of said leaves, so as to present an opening of tapering width for convenient egress of a napkin, whereby a napkin may be withdrawn from said stack of folded napkins within the dispenser by grasping the free edge of the outermost ply extending transversely of said opening and pulling it away from said opening.

4,094,443

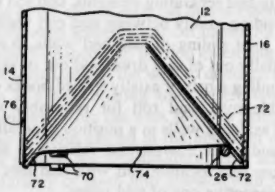
PAINT STRAINER DISPENSER

James P. Whelan, N. Marshfield, Mass., assignor to Ad-Tec Products, Inc., Plymouth, Mass.

Filed Jun. 25, 1976, Ser. No. 699,663

Int. Cl.[2] B65H *1/00*

U.S. Cl. 221—63 **5 Claims**



1. A dispenser for the dispensing of containers from an inverted stack of containers, said containers having diametrically disposed, radially extending ears, comprising a vertically elongate tubular structure open at its bottom, said tubular structure having diametrically disposed openings at the back and front sides extending from top to bottom of a width to receive the diametrically disposed ears of a stack of containers

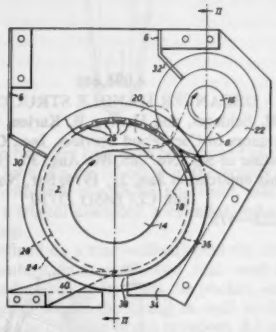
situated in the structure, a support bar adjacent the lower end of the structure extending across the opening at the back side, two supports at the front side, one at each side of the opening at the front side, said supports at the back and front side being so situated that when the inverted stack is disposed in the structure, the ears at the back side of the stack extend through the opening at the back side over the support bar, the ears at the front side extend through the opening at the front side and the rim of the lowermost container of the stack rests on the supports at the opposite sides of the opening at the front side, said opening at the front side providing access to the stack to enable grasping the ear at the front side of the lowermost container and thrust the rim at the front side off the supports to thus permit the lowermost container to be pulled downwardly.

4,094,444

SEED METERING DEVICE HAVING HIGH FRICTION MATERIAL ON ROTATING WHEEL

Robert Anthony Willis, Hythe, England, assignor to Stanhay (Ashford) Limited, England

Filed Mar. 18, 1977, Ser. No. 779,416
Int. Cl.[2] A01C *7/04, 7/20*
U.S. Cl. 221—266 **8 Claims**



1. A seed metering device comprising a seed hopper having a base defining an aperture; two sets of contra-rotated circular rotary members driven about adjacent substantially horizontal axes and sealing said aperture in said base, one set of the said rotary members having the form of Vee-belt pulleys each provided with a plurality of regularly spaced single seed receptors at the base of its Vee-shaped peripheral slot and the other set of said rotary members having Vee-shaped protruding rims of high friction material penetrating upper parts of the said slots with close tolerance to sweep open faces of said seed receptors; and at least one masking plate mounted in said seed hopper and having an arcuate edge closely spaced from the said open faces of said seed receptors, said masking plate being located beneath the location at which the Vee-shaped protruding rims sweep said open faces of said seed receptors to maintain single seeds within the receptors until the seeds reach a position at which said seeds can be released from said receptor.

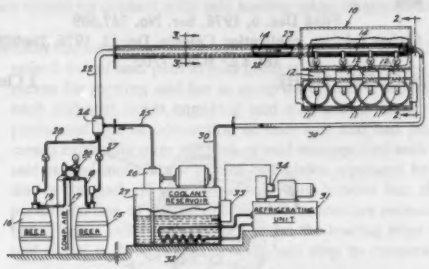
4,094,445

HIGH SPEED BEER DISPENSING METHOD

James Bevan, Hatboro, Pa., assignor to Elliott-Lewis Corporation, Philadelphia, Pa.

Filed Mar. 29, 1973, Ser. No. 346,186
Int. Cl.[2] B67D *1/04;* B65D *83/14*
U.S. Cl. 222—1 **2 Claims**

1. A method of dispensing, from a tap having a plurality of pouring spouts, a beer having a foaming tendency which is directly related to its temperature, comprising the steps of flowing the beer through a supply line to the tap, maintaining the temperatue of the beer at the lap less than 34° F and within about 2° F of its freezing temperature, disposing beneath said spouts a like number of open containers at atmospheric pressure, discharging the beer into said containers simultaneously from said spouts to a predetermined height below the top edges of the containers, covering the open end of each container after



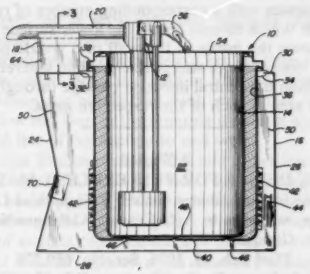
pouring, and thereafter subjecting the liquid and containers to an ambient temperature above the pouring temperature for a sufficient period of time to permit foam to form on the liquid in the containers.

4,094,446

HEATED DISPENSER FOR HOT TOPPINGS AND THE LIKE

James W. Brutsman, Cheyenne, Wyo., assignor to Wyott Corporation, Cheyenne, Wyo.

Filed Mar. 1, 1976, Ser. No. 662,363
Int. Cl.[2] B67D *5/62*
U.S. Cl. 222—146 HE **7 Claims**

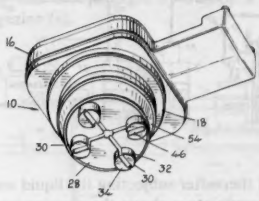


1. A heated dispenser for heat-softenable products susceptible of being pumped which comprises: an outer shell with an opening in the top thereof; an open-topped inner shell disposed within the opening in the outer shell cooperating therewith to define a double-walled insulated housing; an electrically powered heating element located between the walls of the housing in position adjacent the inner shell; an open-topped storage vessel removably mounted inside the inner shell of the housing, said inner shell and heating element coacting upon actuation of the latter to produce a heated jacket effective to warm the contents of said storage vessel; a pump subassembly detachably resting atop the storage vessel for removing the contents thereof, said pump assembly including lid-forming means for covering the open top of said vessel, externally-operable pump means extending down into the interior of said vessel through the lid-forming means, and a spigot positioned to receive the output of the pump means and deliver same over the side of the housing; and, means comprising an electrically-heated saddle carried by said housing in position to cradle the spigot of the pump assembly when the latter is in position atop the storage vessel, said saddle being operative upon energization to maintain any heat-softenable residues left within the spigot in a pumpable condition.

4,094,447
HEATER CAST FOR MULTI-CAVITY HOT RUNNER EDGE GATE

Jobst Ulrich Gellert, 11 Newton Rd., Brampton, Ontario, Canada

Filed Dec. 6, 1976, Ser. No. 747,609
Claims priority, application Canada, Dec. 2, 1976, 266988
Int. Cl.[2] B29F *1/02*
U.S. Cl. 222—146 HE 2 Claims



2. An improved heater cast for multi-cavity hot runner edge gate injection molding providing for hot melt to flow downward through a central injection passage to a plurality of peripheral gates, the heater cast comprising:

(a) a mid portion having a cylindrical outer wall and a substantially flat lower surface, and

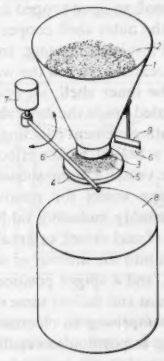
(b) a corresponding number of spaced lower nozzle portions extending downwardly around the periphery of the mid portion to positions each adjacent one of the gates respectively, each of the lower nozzle portions having a cylindrical outer wall and a substantially flat lower face;

wherein the central injection passage extends downwardly to the lower surface of the mid portion of the heater cast where it communicates with a corresponding number of radial channels each of which extends across the lower surface of the mid portion, down the inside of the wall of a nozzle portion and across the lower face of said nozzle portion, whereby the melt branches from the central injection passage through the channels to the area of each of the respective gates.

4,094,448
DOSING DEVICE FOR PULVERULENT MATERIAL

Helmut Häseler, and Günter von der Kall, both of Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 19, 1976, Ser. No. 659,278
Claims priority, application Germany, Feb. 25, 1975, 2508066
Int. Cl.[2] G01F *11/00*
U.S. Cl. 222—342 6 Claims

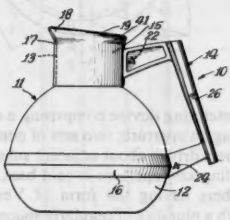


1. A device for dosing a pulverulent material into an open vessel, comprising a funnel-shaped storage container for pulverulent material, the container having an outlet aperture at its lower end, a plate located beneath the said aperture at a distance therefrom so that in use a standing column of material is formed between the plate and the aperture, a dosing rod which is displaceable in a horizontal plane which passes through the column of material, movable means supporting the dosing rod to move from positions disposed completely outside of the column of material and projected borders of the plate to positions passing through the column of material, means for periodically passing the rod from positions completely outside through the column of material thereby to convey at each such passage a predetermined quantity of material into the open vessel which is located beneath the dosing device, and a stripper is arranged above the plane of the dosing rod at such a position that with each passage of the dosing rod through the column the stripper carries any residues of substance left on the rod into the open vessel by wiping contact with the dosing rod above the open vessel.

4,094,449
DECANTER HANDLE STRUCTURE

Norman H. Schlegel, and Harvey R. Karlen, both of Chicago, Ill., assignors to Cory Food Services, Inc., Chicago, Ill.

Continuation of Ser. No. 285,090, Aug. 30, 1972, abandoned.
This application Jan. 21, 1974, Ser. No. 434,810
Int. Cl.[2] B65D *23/10*
U.S. Cl. 222—475 6 Claims



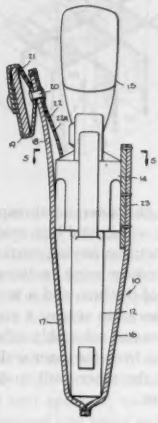
1. For use with a glass decanter having a globular bowl portion having a bottom and terminating in an upper tubular portion defining a pouring spout, a handle structure comprising

a unitary element defining an annular collar having spaced apposed rear ends and adapted to embrace said spout, a segmentally annular band having spaced apposed rear ends adapted to be separably juxtaposed to cause said band to grip said bowl portion at a position spaced above said bottom thereof, and a longitudinally split handle having a first portion connecting one of said collar ends to one of said band ends, a second portion connecting the other of said collar ends to the other of said band ends, and locking means defined by portions of said handle first and second portions immediately adjacent said rear ends of said band and collar for releasably locking said handle first and second portions together to retain said collar about said spout and said band about said bowl portion spaced above said bottom thereof as a result of the releasable retention of said handle portions together to define a handle for carrying the decanter, each of said collar and band being free of fold portions and defining a continuous arcuate cross section at all times.

4,094,450
OPEN-TOP HOLSTER FOR REVOLVER

Frank Parlante, Brooklyn, and Henry Parlante, Bayside, both of N.Y., assignors to Courtlandt Boot Jack Co., Ltd., New York, N.Y.

Filed Jan. 27, 1977, Ser. No. 763,096
Int. Cl.[2] F41B *13/04*
U.S. Cl. 224—2 B 6 Claims



1. An open-top revolver holster to be strapped to the side of a wearer and so securing the revolver in the holster that only the wearer can withdraw it with his gun hand, said revolver having a barrel, a trigger assembly, a cylinder and a grip, the holster comprising:

A. a pocket defined by a rear wall adjacent the wearer and a complementary front wall, said rear wall having a tongue extending upwardly from the pocket, said pocket being shaped to socket the barrel as well as the trigger assembly and the cylinder of the revolver, the grip of the revolver being exposed above the pocket; and

B. a catch plate formed of resilient synthetic plastic material whose profile conforms to that of the tongue to which it is marginally secured, the lower straight-edged portion of the plate projecting into the pocket and including a free depressible sector which normally bulges away from the inner surface of the pocket, the sector being so positioned that when the revolver is being inserted the cylinder depresses the sector to admit the revolver into the pocket, and when the revolver is fully inserted the edge of the sector springs out to intercept the upper end of the cylinder to prevent unauthorized withdrawal of the revolver, said sector having a memory whereby for the wearer to draw the gun he must first depress the sector to clear the cylinder, the sector when released always reverting to its normal bulge, said plate being molded of thermoplastic polycarbonate material which has high impact strength and is dimensionally stable and has a persistent memory.

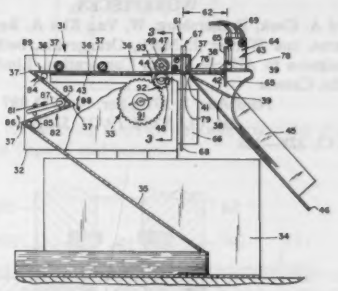
4,094,451
LOTTERY TICKET DISPENSER FOR BREAK-RESISTANT WEB MATERIAL

George F. Wescoat, Manchester, N.H., assignor to Granite State Machine Co., Inc., Manchester, N.H.

Filed Nov. 4, 1976, Ser. No. 738,726
Int. Cl.[2] B26F *3/00*
U.S. Cl. 225—96 6 Claims

1. A lottery ticket dispenser of the type having a continuous web of individual lottery tickets, separated by perforated lines, guided along a path from a supply compartment to a breaker bar station proximate a delivery chute, said dispenser having friction feed mechanism advancing said web along said path, ticket bowing means on said path, just in advance of said breaker bar station, for rigidifying each successive endmost ticket to span said breaker bar station, and stop means including a limit switch in the path of the leading edge of each said successive endmost ticket for stopping said feed mechanism when closed by contact with said leading edge, characterized by

breaker bar means including a pivoted breaker bar normally poised out of said path at said breaker bar station; power means for moving said bar in an upward path to separate each endmost ticket engaging said stop means along its perforated line of connection to said web and bed plate means extending over the path of said unsupported web at said station including a pair of bed plates separated by a slot in the path of said upward moving breaker bar, the perforated line of connection of each successive endmost ticket being located in said slot when the leading edge of said ticket is in engagement with said stop to cooperate



with said bar in separating said endmost ticket despite flimsiness of said web and;

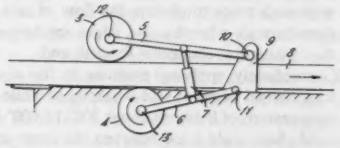
pre-breaking means comprising a set of three cylindrical rolls mounted along said path in advance of said breaker bar station for pre-folding each said ticket first in one direction and then in the opposite direction along its perforated line of connection to said web;

said friction feed mechanism and said ticket bowing means comprises a pair of smooth faced rolls forming a pressure nip at each opposite end thereof, the lower roll having a pair of annular, spaced apart centrally located grooves each of arcuate cross section and the upper roll having a pair of annular, spaced apart centrally located friction rings of yieldable rubber like material, each ring being arranged to distort the adjacent portion of a ticket down into one of said grooves to bow the same in a smooth curved cross section.

4,094,452
ARRANGEMENT FOR ADJUSTING THE COMPRESSION FORCE OF DRIVE ROLLS

Markku Makela, Tampere, Finland, assignor to Rauma-Repola Oy, Finland

Filed Mar. 10, 1977, Ser. No. 776,481
Claims priority, application Finland, Mar. 10, 1976, 760617
Int. Cl.[2] B65H *17/34*
U.S. Cl. 226—34 7 Claims



1. A system for adjusting the compression force exerted

upon a lengthy article as it is driven along a feed line comprising:

a plurality of drive rolls disposed about the periphery of said article and in contact with the surface thereof;

an arm means associated with each drive roll for pivotably mounting each drive roll to a support structure;

drive means for said drive rolls for advancing said lengthy article along said feed line;

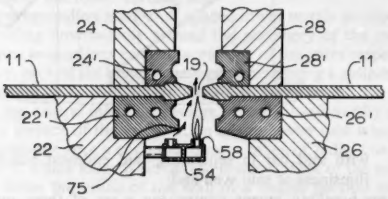
means connected between said arm means and operatively connected to said drive means and adapted to adjust the compression force between said rolls in proportion to the force exerted by said drive means to advance said lengthy article along said feed line.

4,094,453

METHOD FOR PRESSURE WELDING METAL WORKPIECES

Lloyd A. Cook, Parkersburg, W. Va.; Kim A. Reynolds, Shelburne, and Werner J. Mark, Orangeville, both of Canada, assignors to Alforge Metals Corporation, Limited, Orangeville, Canada

Filed Aug. 2, 1976, Ser. No. 711,037
Int. Cl.[2] B23K *19/00, 5/14*
U.S. Cl. 228—265 **11 Claims**



1. A method of pressure welding together metal workpieces which comprises:

(a) juxtaposing a longitudinal edge of a first workpiece gripped between a pair of dies into substantially parallel spaced alignment with a longitudinal edge of a second workpiece gripped between a second pair of dies,

(b) maintaining the longitudinal edge of the first workpiece between about 1/32 to 1 inch away from the opposed longitudinal edge of the second workpiece so as to form an elongated open rectangular channel therebetween,

(c) introducing a uniform stream of heated gases into the proximity of the opposed longitudinal edges and causing a portion of said stream of heated gases to flow through said elongated open rectangular channel,

(d) maintaining the flow of heated gases through said elongated open rectangular channel for a time sufficient to heat the surfaces of said opposed edges to a temperature within the range of from about 200° to 900° F and to form a core of relatively cooler and harder material within each edge,

(e) stopping the flow of heated gases and eliminating said elongated open rectangular channel by moving the longitudinal edges of said workpieces into abutting relationship with each other to obviate the flow of said heated gases therethrough whereby said edges are heated only when the rectangular channel is formed, and

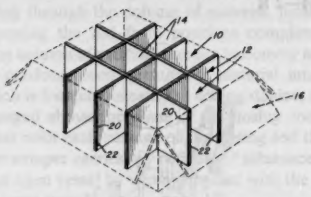
(f) immediately applying pressure to the abutting heated longitudinal edges of said workpieces while they are at a temperature of between about 200° to 900° F to create a solid-phase weld bond between the cores and to upset a portion of heated adjacent surfaces and cause heated metal to be substantially displaced out of the plane of said pressure welded interface.

4,094,454

PARTITIONS WITH RELEASABLE GRIPPING EDGES

Herbert Clarke Snyder, Brockway, Pa., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Jun. 13, 1977, Ser. No. 805,853
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—15 **5 Claims**



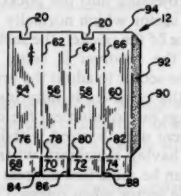
1. A partitioned container comprising a box, a partition removably received within said box, said box having an inner wall surface, said partition having vertical edge portions, top edge portions, and bottom edge portions engageable with the inner wall surfaces of the box, and a movement resisting substance primarily adhered to at least a portion of said partition vertical edge portions and releasably adhered to the inner wall surface for separation from the inner wall surface while retaining the integrity of the inner wall surface and the partition vertical edge portions.

4,094,455

COMBINATION SHIPPING AND STORAGE CONTAINER AND METHOD

Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 736,987, Oct. 29, 1976, Pat. No. 4,056,913, which is a division of Ser. No. 557,420, Mar. 11, 1975, Pat. No. 4,040,558. This application Oct. 28, 1977, Ser. No. 846,348
Int. Cl.[2] B65D *5/35, 5/02*
U.S. Cl. 229—15 **1 Claim**



1. A production blank for forming an inner cell structure for use in a combination shipping and storage container comprising:

(a) a generally four-sided cell structure having a top portion and a bottom portion and having a pair of end panels and a pair of centrally located panels positioned between the end panels on the production blank forming the cell structure;

(b) means, associated with one of the end panels, for fastening to the other of the end panels to form the cell structure;

(c) flap means formed on the bottom portion of the cell for forming a bottom for the cell; and

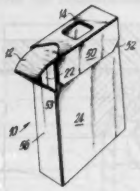
(d) at least two notches, formed in the top portion, said notches adapted to face each other by being positioned and formed in opposite sides of the cell.

4,094,456

RECLOSABLE DISPENSING CARTON

Harry I. Raccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Apr. 25, 1977, Ser. No. 790,573
Int. Cl.[2] B65D 5/72
U.S. Cl. 229—17 SC 6 Claims



1. A reclosable dispensing carton made of a single sheet of carton blank and comprising an elongated tubular enclosure including first and second side panels, and first and second end panels; said enclosure being closed at one end while the other end is closed by, in turn and in overlapping relationship, a first tab extending from said first side panel and including an aperture therein, said aperture disposed intermediate the length of said first tab; a second tab extending from said first end panel and extending for only a portion of the length of said first tab so as to not obstruct said aperture; an elongated closure tab extending from said second end panel and covering the aperture; and a cover tab extending from said second side panel and including a first section overlapping said closure tab and an aperture which is in registration with the aperture of said first tab and a second section that is adhesively bonded to said first side panel; said closure tab being connected to a portion of said second end panel that is pivotally connected to said tubular enclosure whereby said closure tab is slidably received intermediate the first tab and said first section of the cover tab, and may be slidably displaced in a direction opposite to said second tab extending from said first end panel to uncover the registered apertures in the first tab and the cover tab, said first side panel including a depressed glue area receiving wholly therein said second section of said cover tab.

4,094,457

COLLAPSIBLE DRUM-TYPE CONTAINER

George A. Spillson, Monroe, Mich., assignor to Consolidated Packaging Corporation, Monroe, Mich.

Filed Oct. 17, 1977, Ser. No. 842,590
Int. Cl.[2] B65D 3/02, 5/00
U.S. Cl. 229—21 19 Claims

1. A drum-shaped container composed of a single sheet of foldable material comprising:

(A) eight vertical equal and substantially rectangular side panels forming an octagonal prism with an open top and a closed bottom,

(B) a pair of flaps at diametrically opposite corner edges of said prism, each flap being attached to one side panel and overlapping and attached to the adjacent side panel,

(C) alternate straight angular upwardly and downwardly foldlines between the bottom of each side panel and the bottom of the container, which angles of adjacent foldline are about 10° with respect to each other,

(D) eight triangularly shaped panels separated by creases diagonally from each corner of the octagon forming said bottom,

(E) two opposite triangular double-thickness flaps hinged to the bottom edges of opposite adjacent pairs of said panels and folded under said container against said bottom, and

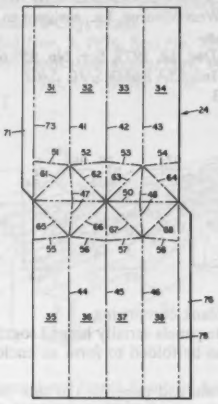


FIG.

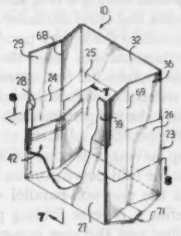
(F) means for fastening said two opposite triangular double-thickness flaps to said bottom.

4,094,458

REUSABLE, COLLAPSIBLE SHIPPING CONTAINER

Bennie Charles Nelson, Jr., Chicago, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Mar. 7, 1977, Ser. No. 775,040
Int. Cl.[2] B65D 5/10, 5/36
U.S. Cl. 229—39 R 11 Claims



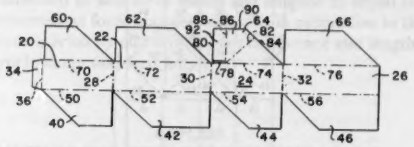
9. A container blank comprising a scored and cut sheet of material, said sheet including first and second end panels transversely hinged to a first side panel, a second side panel being transversely hinged to said second end panel, a tab being transversely hinged to said second side panel, said first and second end and side panels each having a top end and a bottom end, a top flap being longitudinally hinged to said top end of each of said first and second end and side panels, a bottom flap being longitudinally hinged to said bottom end of each of said first and second end and side panels, said bottom flaps each having a longitudinal hinge line dividing each bottom flap into first and second portions, said longitudinal hinge lines of said bottom flaps being positioned in generally longitudinal alignment with each other, and said first and second end panels, and their respective top and bottom flaps having a generally centrally located transverse hinge line whereby upon the setting up of said container blank into a container the latter is collapsible by relative folding movement of said first and second panels about said transverse hinge lines and by relative folding movement of said bottom flaps of at least said first and second side panels about said dividing longitudinal hinge line.

4,094,459

CONTAINER WITH EASY TUCK-UNDER FLAP FOR OVERLAPPING CLOSURE AND METHOD

Everett A. Coons, West Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Filed Dec. 12, 1977, Ser. No. 859,672
Int. Cl.[2] B65D 5/10, 5/02
U.S. Cl. 229—41 B **12 Claims**



1. A container blank comprising

a plurality of side panels serially hinged together so that the side panels can be folded to form an enclosed wall for a container,

a joint flap on one end panel of the side panels for being secured to the other end panel of the side panels to form the enclosed wall,

bottom means attached to the bottom edges of the side panels for closing the bottom of the container,

a plurality of trapezoidal closure flaps each having the longer of the two parallel edges thereof hinged to the top edge of the respective side panel,

said closure flaps having dimensions for being sequentially folded together so that one side portion bordered by one of the non-parallel edges of each closure flap is overlapped by another side portion bordered by the other non-parallel edge of an adjacent flap,

one of the closure flaps having a slit extending along a segment of the longer parallel edge thereof from the one non-parallel edge thereof to an inner end of the slit,

said one closure flap also having a first scoreline extending across the one closure flap from the inner end of the slit at an acute angle relative to the longer parallel edge thereof toward the other non-parallel edge thereof to form a fold-down portion between the first scoreline and the one non-parallel edge thereof to permit the one side portion of the one closure flap to be inserted beneath the another side portion of the corresponding adjacent closure flap, and

said one closure flap having a second scoreline extending from the slit across the fold-down portion intermediate the first scoreline and the one non-parallel edge of the one closure flap to define a reverse folding portion between the second scoreline and the one non-parallel edge for being reverse folded relative to the remaining portion of the fold-down portion to substantially reduce the extent of protrusion of the fold-down portion into the container during insertion of the one side portion of the one closure flap beneath the another side portion of the corresponding adjacent closure flap.

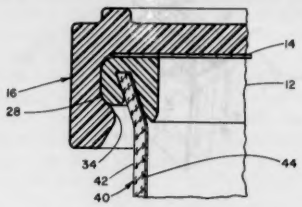
4,094,460

CLOSURE ASSEMBLY AND PACKAGE

Theodore P. Scanga, Lower Burrell, and Robert E. Callender, Frazer Township, Allegheny County, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 26, 1976, Ser. No. 680,360
Int. Cl.[2] B65D 53/02
U.S. Cl. 229—43 **5 Claims**

1. A closure assembly for sealing a container having a closed end and an open end and having a metal foil layer on the inside surface thereof with a heat seal resin on the foil layer, comprising a molded plastic sealing ring having inner and outer walls defining a channel therebetween for receiving and sealing against the foil layer at the open end of such a container, with said inner wall including an outwardly facing frusto-conical surface of increasing outward extent toward the bottom of the channel, said surface being adapted for exerting pressure against the foil layer in order to facilitate induction heat sealing of the ring thereto, a sealing surface defined by the top of the ring, and an outer shoulder below said sealing surface, a metal foil liner having an upper and lower surface and overlying said ring including said sealing surface thereon and disposed against such sealing surface, and having a heat seal coating on at least



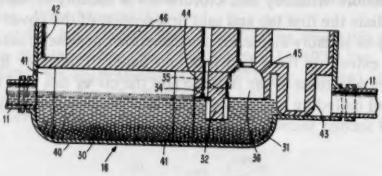
the outer portion of the lower surface thereof in contact with the sealing surface on the ring to be heat sealed to the ring upon induction heating of said liner, and a flexible plastic overcap having a top wall portion overlying said ring and liner and a depending skirt around the overcap with an inwardly projecting lip on said skirt engaged under the shoulder on said sealing ring.

4,094,461

CENTRIFUGE COLLECTING CHAMBER

Robert Melroy Kellogg, Endwell, and Alfred Paul Mulzet, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,243
Int. Cl.[2] B04B 11/06
U.S. Cl. 233—40 **12 Claims**



1. Apparatus for continuous collection of an intermediate one of three or more stratified fractions of a liquid mixture at the outlet end of a centrifuge container comprising:

means forming a chamber;

a dam across said chamber for blocking flow only of one of said intermediate fractions;

first withdrawal port means extending interiorly of said chamber into the stratum of said blocked intermediate fraction; and

second withdrawal port means at the downstream side of said dam extending into said chamber substantially the same distance as said first withdrawal port means whereby the location of said intermediate fraction is maintained having removal of the other of said fractions.

4,094,462

METHOD AND MEANS FOR PROVIDING AND TESTING SECURE IDENTIFICATION DATA

John L. Moschner, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 2, 1976, Ser. No. 710,827
Int. Cl.[2] G06F 7/02; G06K 7/08
U.S. Cl. 235—419 **21 Claims**

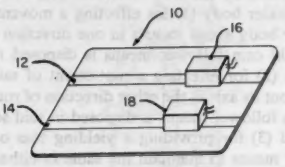
5. Apparatus for testing the legitimacy of an identification element, comprising

sensing means for sensing first, second and third categories of information from said identification element;

first storage means for storing the first category of information sensed from the identification element;

second storage means for storing the second category of information sensed from the identification element;

third storage means for storing the third category of information sensed from the identification element;



information processing means to generate output data from a specified sequence of operations performed upon said first and second categories of information transmitted to said information processing means from said first and second storage means; and

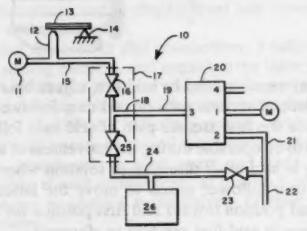
comparison means for comparing said output data with said third category of information transmitted from said third storage means and capable of indicating whether or not said output data and said third category of information are identical.

4,094,463

SYSTEM HAVING RESET ACTION

Sylvester Milewski, Morton Grove, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 23, 1977, Ser. No. 780,636
Int. Cl.[2] H01M *4/86;* G05B *11/50*
U.S. Cl. 236—82 20 Claims



1. A system for providing reset action comprising:

pressure dividing means having a first input adapted to receive an input signal, a second input connected to receive a feedback signal and an output providing a pilot signal which is a division of said input signal and said feedback signal;

output means having an input and an output;

connecting means connecting said output of said pressure divider means to said input of said output means and connecting said output of said output means to said second input of said pressure divider means; and,

capacity means connected to said connecting means for delaying a change in said feedback signal upon an occurrence of a change in said input signal,

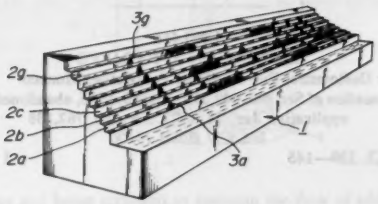
said output means producing an output signal having a predetermined relationship to said pilot signal.

4,094,464

THREE DIMENSIONAL DISPLAY DEVICE USING WATER FOUNTAIN

Koichi Kawamura, and Yoshiko Kawamura, both of No. 66, Jomyoji, Kamakura City, Japan

Filed Nov. 5, 1976, Ser. No. 739,104
Claims priority, application Japan, Nov. 14, 1975, 50-136351
Int. Cl.[2] B05B *17/08*
U.S. Cl. 239—17 7 Claims



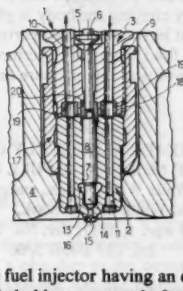
1. A three dimensional water fountain display device comprising a nozzle matrix in which the nozzles thereof are arranged in a series of vertical steps and in aligned relation, said nozzles being thus able upon the discharge of water from selected ones of said nozzles to display desired characters, numerals and other notational representations, an electromagnetic valve operatively connected to each of said nozzles, and a controller circuit associated with each of said valves so as to enable the display of the desired pattern of characters, numerals and other notational representations in three dimension by a combination of selected ones of said nozzles in operation.

4,094,465

METHOD AND DEVICE FOR OBVIATING THE RISK OF INJECTION FUEL LEAKAGE, MORE PARTICULARLY INTO THE COOLING SYSTEM OF DIESEL ENGINE INJECTORS

Dirk Bastenhof, Eaubonne, France, assignor to Societe d'Etudes de Machines Thermiques S.E.M.T., Saint-Denis, France

Filed Jan. 19, 1977, Ser. No. 760,570
Claims priority, application France, Feb. 20, 1976, 7604813
Int. Cl.[2] B05B *15/00*
U.S. Cl. 239—132.3 6 Claims



1. A diesel engine fuel injector having an elongated injector nozzle body, a nozzle holder at one end of said body, the body and holder having glazed mating surfaces in a plane transverse to the longitudinal axis of the nozzle body, a bore through the body and holder, an injector push rod and needle in said bore, a fuel leakage recovery passage in the holder, and coolant inlet and return passages extending lengthwise of the body and holder across said transverse plane, the coolant passages being spaced from the fuel leakage recovery passage, wherein the improvement comprises

a counterbored section in each of the coolant inlet and return

passages in one of the injector nozzle body and holder adjacent said transverse plane;

a sleeve fitted tightly in each of said counterbored sections so that one end thereof terminates at said plane;

an annular relief passage being provided adjacent the outer periphery of each sleeve at said one end; and

channels at least one of said mating surfaces communicating between each of said annular grooves and the leakage fuel recovery passage to provide a low pressure fuel leakage return path and prevent fuel contamination of the coolant.

4,094,466

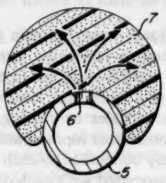
IRRIGATION APPARATUS

Oscar DeRomano, Rue du Stade, Fontvieille, Monaco

Continuation of Ser. No. 649,339, Jan. 15, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 762,138

Int. Cl.[2] B05B *15/00*

U.S. Cl. 239—145 **1 Claim**



1. An irrigation apparatus for use with a cylindrical distribution pipe having apertures at spaced locations along the pipe, said apparatus comprising: a porous structurally rigid, solid body formed by sintering a quantity of plastic particles leaving interstitial spaces therebetween and thereby permitting flow of water therethrough, said body having a generally cylindrical shape with a central longitudinal axis adapted to be parallel with the axis of said distribution pipe, the lower portion of said body having a hollow portion extending therethrough with the longitudinal axis thereof parallel to the central axis of said body, said hollow portion having a cross-section which is at least semi-circular and wherein the greatest extent of said hollow portion into said body is at the central axis of said body, said hollow portion forming with said body two longitudinally extending, transversely depending sections which are adapted to conform to the exterior surface of said distribution pipe so that the apparatus can be engaged and retained in a self-supporting position by clipping the body in place about the distribution pipe over at least one of said apertures to distribute and diffuse a flow of fluid from said aperture into the area surrounding the apparatus at low pressure and low flow rates.

4,094,467

SPRINKLER HEAD SELECTIVELY OPERABLE IN A PART-CIRCLE MODE OR A FULL CIRCLE MODE

Larry P. Meyer, Walla Walla, Wash., assignor to Nelson Irrigation Corporation, Walla Walla, Wash.

Filed Apr. 1, 1977, Ser. No. 783,758

Int. Cl.[2] B05B *3/08*

U.S. Cl. 239—230 **13 Claims**

1. A sprinkler head selectively operable in a part-circle mode or a full circle mode comprising:

a sprinkler body having an inlet and an outlet;

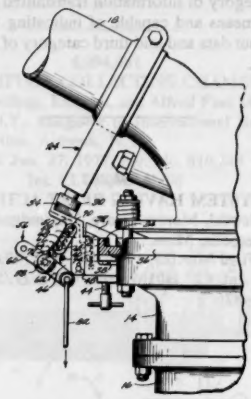
stationary means for mounting said sprinkler body for controlled rotational movement about a generally vertical axis with said inlet in communication with a conduit arranged to communicate a source of water under pressure therewith;

said outlet being disposed to direct water under pressure communicated with said inlet in a stream flowing therefrom in a direction upwardly and outwardly in generally symmetrical relation to a plane passing through the axis of rotation;

cam follower means mounted on said sprinkler body for movement with respect thereto between (1) a first position wherein said cam follower means moves rotationally with said sprinkler body along a first arcuate path and (2) a spaced second position wherein said cam follower means moves rotationally with said sprinkler body along a second arcuate path spaced from said first arcuate path,

means operable by the flow of water communicated with said sprinkler body (1) for effecting a movement of said sprinkler body about its axis in one direction of rotation when said cam follower means is disposed in said first position, (2) for effecting a movement of said sprinkler body about its axis in the other direction of rotation when said cam follower means is disposed in said second position, and (3) for providing a yielding bias on said cam follower means to maintain the same in either one of its positions during the movement of said sprinkler body in the corresponding direction of rotation;

first and second adjustable means mounted on said stationary means for independent movement with respect to each other into any one of a plurality of variably spaced fixed positions of arcuate adjustment with respect to the axis of rotation of said sprinkler body,



first cam means carried by said first adjustable means within the second arcuate path of said cam follower means and outside the first arcuate path of said cam follower means so as to be operable during the movement of said sprinkler body in said other direction of rotation when engaged by said cam follower means to move the latter out of said second position toward said first position for biased maintenance in said first position as aforesaid,

second cam means mounted on said second adjustable means for movement between (1) a part-circle operative position within the first arcuate path of said cam follower means so as to be operable during the movement of said sprinkler body in said one direction of rotation when engaged by said cam follower means to move the latter out of said first position toward said second position for biased maintenance in said second position as aforesaid and (2) a full circle operative position out of said first arcuate path of said cam follower means so as to permit movement of said sprinkler body in said one direction with said cam follower means bias maintained in said first position through a multiplicity of rotations; and

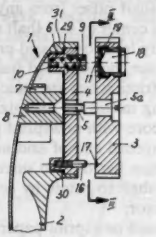
means for selectively moving said second cam means between said part-circle operating position and said full circle operating position to thereby selectively determine the mode of operation of said sprinkler head.

4,094,468

HAND SHOWER

Günter Volle, Bad Liebenzell, Germany, assignor to Schläfer G.m.b.H. & Co., Bad Liebenzell, Germany

Filed Dec. 2, 1976, Ser. No. 746,808
Claims priority, application Germany, Dec. 24, 1975, 2558796
Int. Cl.[2] B05B *1/18*; A47K *3/22*
U.S. Cl. 239—394 12 Claims



1. A hand shower, which comprises
a head body defining an internal flow passage, having an inlet end and an outlet end,
a socket carried by said head body in said flow passage and having a screw-receiving opening which is coaxial with said outlet end,
a screw which extends coaxially in said outlet end, and said screw-receiving opening is detachably fixed in said head body,
a U-shaped baffle carried by said head body in said flow passage, and spaced around said socket and open toward said inlet end, and adapted to divide a flow entering said passage through said inlet end,
a stationary cover plate coaxially mounted on said screw disposed in said outlet end, and formed with an axially open and eccentric counterbore, which is disposed on that side of said socket that is opposite to said inlet end,
a nozzle plate which is rotatably mounted on said screw in said outlet end, axially outwardly of said cover plate and in close proximity thereto,
an annular sealing element which is in sealing contact with said counterbore and protrudes from said cover plate to engage said nozzle plate,
a coil spring disposed in said counterbore, axially inwardly of said sealing element, and engaging the latter to urge it against said nozzle plate and adapted to impart turbulance to liquid flowing through said counterbore, and
a plurality of different nozzle passages, which extend through said nozzle plate and are eccentrically disposed therein, peripherally spaced apart and have the same eccentricity as said counterbore, so that each of said nozzle passages is adapted to selectively register with said counterbore.

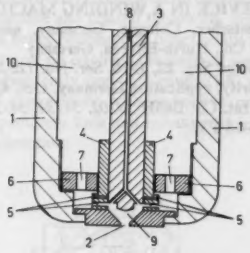
4,094,469

FUEL INJECTION NOZZLE ASSEMBLY

Theo Woringer, Zurich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Nov. 24, 1976, Ser. No. 744,781
Claims priority, application Switzerland, Dec. 12, 1975, 16139/75
Int. Cl.[2] B05B *7/10*
U.S. Cl. 239—405 2 Claims

1. A fuel injection nozzle assembly particularly for gas turbines comprising a nozzle holder, a nozzle plunger extending generally centrally of said holder, fuel inlet passage means defined between said holder and said plunger, means defining a nozzle exhaust opening, said nozzle plunger having an end terminating adjacent said nozzle exhaust opening, means defining a swirl chamber extending to between said plunger end and said nozzle opening, tangential port means through which fuel flows between said fuel inlet passage means and said swirl chamber, and additive supply means for introducing a fuel additive into said nozzle assembly, said additive supply means comprising an additive inlet duct provided in said nozzle



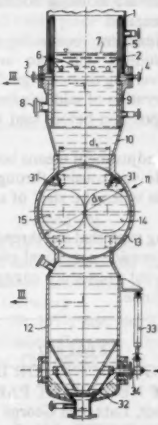
plunger and being arranged to maintain the flow of additives through said nozzle assembly separate from the fuel flowing therein and to deposit said additives directly in said swirl chamber.

4,094,470

COMMINUTOR FOR USE IN A GASIFYING INSTALLATION

Reinhard Waldhofer, Essen, Germany, assignor to Krupp-Koppers GmbH, Essen, Germany

Filed Jan. 31, 1977, Ser. No. 764,453
Claims priority, application Germany, Feb. 2, 1976, 2606039
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—46 R 9 Claims



1. In an arrangement of the type having a gasifying vessel for gasifying solid combustible substances therein with an attendant development of ashes and cinders, a combination comprising means defining a chamber at the bottom of the gasifying vessel; comminuting means situated below said chamber and communicating therewith; and means for maintaining in said chamber and in said comminuting means a body of a liquid which captures the ashes and cinders in the form of clinker which gravitationally descends through said liquid body from said chamber toward said comminuting means to be comminuted by the latter to particles of at most a predetermined size, including means for supplying the liquid into said chamber, means for discharging at least some of the liquid from said chamber including at least one outlet port located upwardly of said comminuting means, and shielding means in said chamber

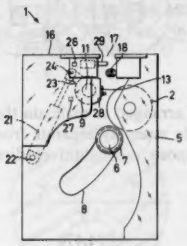
for preventing the clinker from reaching and entering said outlet port.

4,094,471

DEVICE FOR FEEDING THREAD INTO A TRAVERSING DEVICE IN A WINDING MACHINE

Alfred Tschentscher, Cologne, Germany, assignor to FMN Schuster & Co., Hurth-Efferen, Germany

Filed Sep. 22, 1976, Ser. No. 725,581
Claims priority, application Germany, Oct. 4, 1975, 2544538
Int. Cl.[2] B65H *54/02, 54/34, 54/20*
U.S. Cl. 242—18 PW **14 Claims**



1. A device for feeding thread into a winding and traversing mechanism of a winding machine having an entrainment means and a slot wherein the thread is fed to a spool via a traversing device having a thread guide and a reverse thread roller and the start of the thread is fed to said entrainment means via said slot that is open at one end in the winding machine, the combination comprising:

(a) a traversing device housing rotatably mounted on the winding machine; and

(b) rotational adjustment means for rotating the housing about a longitudinal axis into an operating position wherein the traversing device is guiding the thread during the winding operation of said winding machine and out of said operating position before said guiding of the thread starts;

(c) said rotational adjustment means being effective to rotate the traversing device housing through an angle about said longitudinal axis when the start of said thread is brought into said slot;

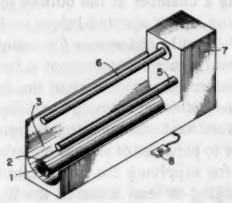
(d) said angle being such that the thread guide of the traversing device lies outside a vertical plane tangential to said housing to prevent premature engagement of said thread by the thread guide.

4,094,472

CORE STRIPPING PROCESS FOR DEPLETED ROLLS OF NEWSPRINT PAPER

Robert Charles Berndt, Lutz, and George B. Eady, Tampa, both of Fla., assignors to Dar-Mar, Inc., Lutz, Fla.

Filed Sep. 27, 1976, Ser. No. 726,970
Int. Cl.[2] B65H *75/00*
U.S. Cl. 242—54 R **1 Claim**



1. A method for separating newsprint paper from the core upon which it is wound, after said core and newsprint paper have been utilized in a newspaper printing process, comprising

a. Starting with

i. A core upon which a depleted amount of newsprint paper is wound,

ii. A cradle,

iii. An open-end, rotatable shaft located in parallel proximity to said cradle,

iv. A friction bar located in parallel proximity to said cradle and shaft offset from any imaginary line drawn between the center of said shaft and the center of a core placed in any location in said cradle,

v. A drive motor, housing and frame to which said shaft, cradle and friction bar are attached, and

vi. A switching means for energizing said motor;

b. Placing said core with newsprint paper in said cradle;

c. Pulling the exposed end of said newsprint paper to slide over said friction bar then to surround said shaft;

d. Causing said shaft to rotate by activating said switching means and motor;

e. Transferring said newsprint paper from said core to said open-end shaft;

f. Causing said shaft to cease rotating by de-activating said switching means and motor; and

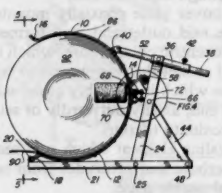
g. Removing said newsprint paper while in rolled configuration from the open-end of said shaft.

4,094,473

PORTABLE DEVICE FOR SUPPORTING A ROLL OF ALUMINUM SHEETING FOR DISPENSING

Lawrence P. Salvino, 285 Milton Rd., Wauconda, Ill. 60084

Filed May 9, 1977, Ser. No. 795,293
Int. Cl.[2] B65H *75/02*
U.S. Cl. 242—55 **4 Claims**



4. A device of the class described comprising pairs of spaced base, side and rear frames: (a) said side frames affixed at one end to said base frames adjacent one end thereof extending upwardly and one towards the other end of said base frames at approximately 105°;

(b) the upper portions of each of said side frames being bent inwardly and upwardly;

(c) said rear frames secured at one end to said one end of said base frames and extending upwardly and forwardly towards said side frames;

(d) a fixed lower curved plate spanning said base frames having a forward marginal end bent outwardly and downwardly and fixed to said base frames;

(e) the opposed marginal end of said lower plate being bent upwardly and rearwardly;

(f) an upper movable curved plate, said plate having the forward marginal end bent upwardly and outwardly, and an opposed end, a hinge, means for fixing said hinge to said opposed ends of said upper and lower plates;

(g) a sleeve pivoted to the upper ends of said side frame members, a rod slidable in said sleeve, one end of said rod pivoted to said upper plate for adjusting said plate towards and away from said lower plate, and means for adjustably fixing said rod in said plate;

(h) a pair of elongated sleeves affixed to said lower plate, and lying in a plane normal to the plane of said plate and adjacent the bend on said opposed edge;

(i) a pair of tubes each slidably positioned in one of said elongated sleeves, respectively, with one end of each having a right angled bend, a rotary drum on each of said ends; and

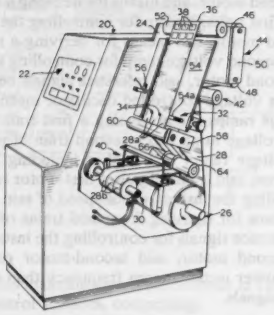
(j) a series of headed plastic rivets on each plate for ease in removing the contents therebetween.

4,094,474

SLITTING APPARATUS

Joseph August Stollenwerk, Oakville, and Reinhard Muhs, Orangeville, both of Canada, assignors to Rotoflex Engraving Limited, Mississauga, Canada

Filed Mar. 3, 1977, Ser. No. 773,882
Int. Cl.[2] B65H 35/02, 75/24
U.S. Cl. 242—56.2 18 Claims



1. Appartus for longitudinally slitting travelling webs of paper and the like to form strips, the apparatus comprising:

means for supporting a rolled web to be slit;

take-up means for winding into rolls, strips of paper and the like formed by slitting the web;

means for guiding the web in a path which extends from said support means to said take-up means; and,

a cutter unit disposed adjacent the path of the web and comprising: at least one cutter head including a knife for forming a slit in the web; and means supporting said cutter head for adjustment in a direction transversely of the path of the web to vary the position of the slit formed by said knife in use; said support means including: an elongate member disposed parallel to the direction of adjustment of the cutter head; a locking element which extends longitudinally of said member over the range of adjustment of said head, the member including a slot receiving said locking element and having an internal cavity communicating with said slot, and the element being movable in the slot between a locking position in which it engages and prevents movement of the cutter head laterally of the web, and a release position permitting adjustment of the cutter head; an inflatable member disposed in said cavity in the elongate member and arranged, when inflated, to move the locking element to its locking position; and means for selectively delivering a fluid pressure medium to said inflatable member to inflate the same and thereby lock the cutter head in an adjusted position.

4,094,475

AUTOMATIC LOCKING SAFETY BELT RETRACTOR

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co. Ltd., Tokyo, Japan

Filed May 6, 1976, Ser. No. 683,574
Claims priority, application Japan, May 7, 1975, 50-053847
Int. Cl.[2] A62B 35/02; B65H 75/48
U.S. Cl. 242—107.4 A 10 Claims

1. A vehicle acceleration responsive safety belt retractor comprising:

a U-shaped frame (A) including side walls;

a reel (E) mounted between said side walls and having a belt (D) coupled thereto and being rotatable in opposite belt extraction and retraction directions;

means spring biasing said reel in a belt retraction direction;

a pair of ratchet wheels (1,2) located on opposite sides of said reel and rotatable and coaxial therewith, the teeth of one of said reels being peripherally offset relative to the teeth of the other reel by one-half the pitch of said teeth;

a pair of independently operable pawls (7,8) rockable into and out of engagement with respective ratchet wheels (1,2) to respectively lock and release said reel in the belt extraction direction;

a cross piece (9) having its opposite end portions engaging substantially transversely aligned eccentric points on said pawls;

a condition sensing member (13) responsive to a predetermined value of the acceleration of said vehicle; and

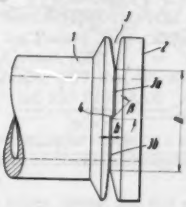
an actuating member (10) movable in response to said sensing member, said cross piece being movable by said actuating member to advance said pawls toward ratchet wheel engage positions and being so disposed that the intermediate portion of said cross piece assumes a rest state proximate said actuating member under normal conditions.

4,094,476

THREAD SPOOL

Max Christof Schmidt, Bonnigheim, and Richard Huber, Beilstein-Billenbach, both of Germany, assignors to Amann & Sohne, Bonnigheim, Germany

Filed Sep. 29, 1977, Ser. No. 837,844
Claims priority, application Germany, Oct. 1, 1976, 2644882
Int. Cl.[2] B65H 75/28
U.S. Cl. 242—125.2 4 Claims

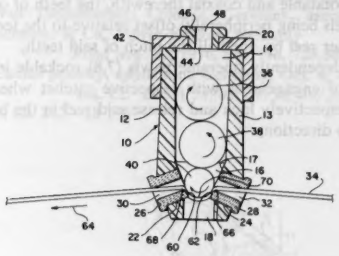


1. Thread spool having a sleeve and two flanges, at least one of the flanges having a notch like peripheral groove for inserting the end piece of a thread, the improvement comprising, the groove having at least two sections which are offset in direction of a spool axis, the sections establishing a single closed groove.

4,094,477
TENSION DEVICE FOR HORIZONTAL YARN

Edward J. McBride, Jr., P.O. Box 311, Moorestown, N.J. 08057

Filed Sep. 7, 1976, Ser. No. 720,904
Int. Cl.[2] B65H *59/22, 59/28*
U.S. Cl. 242—152.1 18 Claims



1. A ball tension device comprising a body having a longitudinal axis and defining a channel in which at least one ball can be positioned to vary yarn tension;

a first opening through the body communicating with the channel to define a yarn inlet passageway,

a second opening through the body communicating with the channel to define a yarn outlet passageway;

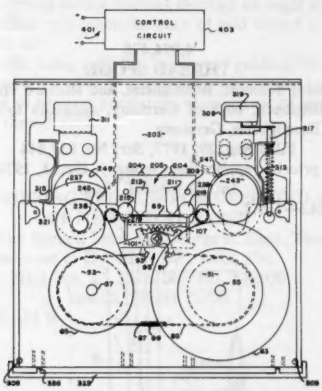
at least one passageway being angularly inclined from the axis to define an angularly inclined conduit through which the yarn passes,

said angular inclination being greater than ninety degrees, whereby the yarn is tensioned by the ball as it leaves the conduit and enters the channel.

4,094,478
DUAL MOTOR TAPE RECORDER SYSTEM

Bansi K. Shroff, Irvine, and Stephen K. Shu, Fountain Valley, both of Calif., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 28, 1975, Ser. No. 635,940
Int. Cl.[2] G11B *15/32, 15/46, 23/10*
U.S. Cl. 242—192 3 Claims

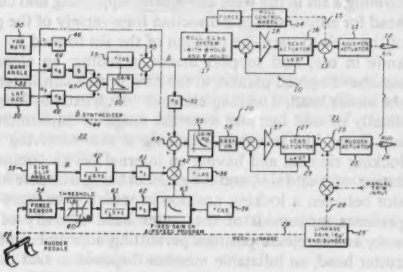


1. A tape transport system comprising a pair of coplanar hubs rotatable about fixed axes and a length of pliable tape carried in rolls on said hubs; a transducer cooperative with a span of tape intermediate said rolls; and drive means for driving said tape across said transducer from one said tape roll to the other said tape roll, said drive means comprising a first capstan movable into engagement with the periphery of a first of said tape rolls, a second capstan movable into engagement with the periphery of the second of said tape rolls, a first variable speed motor drivingly connected to said first capstan and a second variable speed motor drivingly connected to said second capstan, biasing means for biasing said capstans into driving engagement with the peripheries of said tape rolls, and control circuit means connected to both said motors for controlling the speed of each of said motors, said control circuit means further comprising acceleration/deceleration means for controlling the rate of acceleration and deceleration of the system, said acceleration/deceleration means comprising means for generating a first voltage ramp having a pre-selected slope for accelerating said system, means for deriving from said first voltage ramp a first reference signal for controlling the acceleration of said first motor, means for generating a second voltage ramp having a pre-selected slope for decelerating said system, means for deriving from said second voltage ramp a second reference signal for controlling the deceleration of said second motor, and means for deriving a reference signal from said first voltage ramp for controlling the acceleration of said second motor, and means for deriving a reference signal from said second voltage ramp for controlling the deceleration of said second motor, said reference signals being digital, and including a voltage-controlled oscillator means controlled by said voltage ramps for producing a first train of pulses from said first voltage ramp and a second train of pulses from said second voltage ramp, and further including first means for deriving from said trains of pulses first-motor reference signals for controlling the instantaneous speed of said first motor and second means for deriving from said trains of pulses second-motor reference signals for controlling the instantaneous speed of said second motor, said second-motor reference signals having a lower instantaneous frequency than said first-motor reference signals.

4,094,479
SIDE SLIP ANGLE COMMAND SCAS FOR AIRCRAFT

Thomas W. Kennedy, Jr., Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 653,555, Jan. 29, 1976, abandoned. This application Mar. 25, 1977, Ser. No. 781,226
Int. Cl.[2] G05D *1/10*
U.S. Cl. 244—179 8 Claims



1. In a yaw axis stability and command augmentation system for aircraft having a manually actuated rudder controller and a primary and secondary rudder actuator means for positioning the rudder to command a substantially steady state side-slip angle attitude of said aircraft proportional to a substantially steady state force on said manually actuated rudder controller, the combination comprising,

(a) means for supplying a first signal proportional to the side slip angle of the aircraft, including substantially steady state values thereof,

(b) means for supplying a second signal proportional to the force applied to said manually actuated controller including substantial steady state values thereof,

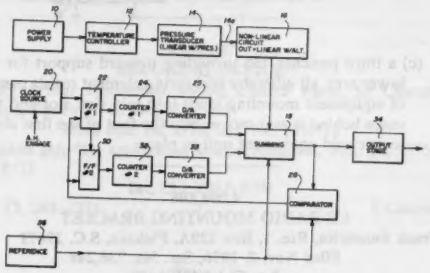
(c) summing means responsive to said first and second signals for supplying a control signal in accordance with the difference therebetween, and,

(d) means supplying said control signal to said secondary actuator for positioning said rudder in accordance therewith, thereby commanding said substantially steady state side-slip angle attitude of said aircraft proportional to said substantially steady state force on said manual controller.

4,094,480
AIRCRAFT ALTITUDE HOLD SYSTEM

John M. Nixon, Mineral Wells, Tex., assignor to Edo-Aire Mitchell, Mineral Wells, Tex.

Continuation of Ser. No. 716,442, Aug. 23, 1976, abandoned.
This application Apr. 4, 1977, Ser. No. 784,525
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—180 23 Claims



17. A system for maintaining aircraft altitude in combination with aircraft control surfaces, comprising:

means responsive to altitude pressure and generating an output signal varying with altitude,

means for generating a reference altitude signal,

means for supplying a standard reference signal,

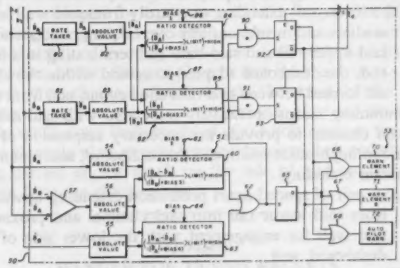
means for combining the reference altitude signal with the signal varying with altitude and with the standard reference signal to generate an altitude hold signal, and

means for comparing the altitude hold control signal with the standard reference signal to generate a control signal to said means for generating a reference altitude signal.

4,094,481
FAIL PASSIVE DUAL SERVO WITH CONTINUOUS MOTOR SPEED AND ACCELERATION AND MONITORING

Michael P. DeWalt, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jun. 30, 1977, Ser. No. 811,653
Int. Cl.[2] G05D *1/00*; G05B *9/03*
U.S. Cl. 244—194 7 Claims



1. A monitored multiple channel automatic pilot for aircraft having a control surface controlled thereby for controlling the attitude and flight path of the aircraft comprising

first and second substantially identical closed loop control channels responsive to attitude and flight path control signals and including corresponding first and second servomotors normally supplying substantially identical outputs for controlling said control surface,

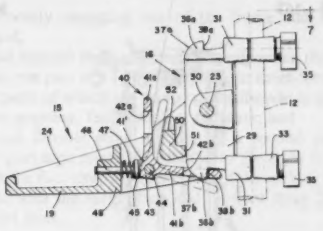
differential means having first and second inputs responsive respectively to the outputs of said first and second servomotors and an output connected to drive said control surface for controlling the attitude and flight path of said aircraft in response to said control signals, and

monitor means continuously responsive to the ratio of the absolute values of the accelerations of said first and second servomotors and the ratio of the absolute values of the velocity difference between said first and second servomotor outputs and the velocity of each of said servomotors outputs for clamping that input to said differential means having the highest acceleration when said velocity ratio exceeds a predetermined value.

4,094,482
DECK MOUNT FOR FISHING MOTOR

Lester C. Weaver, Fayetteville, Ark., assignor to Shakespeare of Arkansas Inc., Fayetteville, Ark.

Filed Dec. 17, 1976, Ser. No. 751,469
Int. Cl.[2] B63H *21/26*
U.S. Cl. 248—4 6 Claims



1. A deck mount for mounting the motor tube of a fishing motor on a boat deck, comprising a base bracket adapted for attachment to the deck, a yoke for holding the motor tube, means for clamping said motor tube in said yoke, said yoke swiveled on said bracket for swinging said motor tube between vertical operating position and horizontal stowed position, single latch means having two angularly disposed intersecting legs adapted selectively to engage and lock said yoke in operating and stowed positions, said latch means pivoted on said bracket at the intersection of said legs, and spring means bearing against said intersection for biasing said latch means into locking engagement with said yoke in either position.

4,094,483
MOUNTING DEVICE

Richard E. Busch, La Puente, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.

Filed Jun. 6, 1977, Ser. No. 803,665
Int. Cl.[2] F16L *3/08*
U.S. Cl. 248—73 2 Claims

1. A device for mounting an article on a support comprising

a one-piece member of plastic material having spaced relatively stiff legs,

said legss having upper, lower, and mid portions,

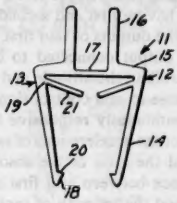
said lower portions adapted to straddle opposite sides of said article,

said lower portions having inwardly extending barbs at the lower ends thereof for latching engagement with said support,

a relatively flexible cross element connected between said mid portions of said legs,

said upper portions being movable toward each other

whereby to rock said arms to release said barbs from latching engagement with said support, and



inward extending yieldable arms integral at their outer ends with said lower portions for engagement with said article.

4,094,484

BALANCED PORTABLE PEDESTALS

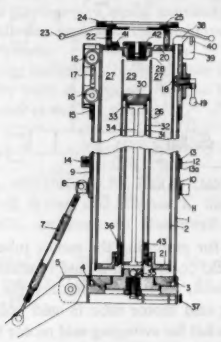
Edward Richard David Galione, Bury St. Edmunds, England, assignor to W. Vinten Limited, Bury St. Edmunds, England

Filed Feb. 28, 1977, Ser. No. 772,422

Claims priority, application United Kingdom, Mar. 13, 1976, 10168/76

Int. Cl.[2] A47F *5/12*

U.S. Cl. 248—162 **8 Claims**



1. A portable pedestal for instruments such as cameras or the like, comprising a base member having an outer column mounted thereon, at least one inner column slidably locatable substantially concentric with said outer column, pressure increasing means operable to pressurise said inner column via valve means during relative movement between said inner and outer columns to produce a pressure of gas within said inner column operable to substantially balance said inner column against an externally applied force on said inner column.

4,094,485

RADIO MOUNTING BRACKET

James S. O'Callaghan, Gilford, N.H., assignor to Tram/-Diamond Corporation, Winnisquam, N.H.

Continuation-in-part of Ser. No. 709,228, Jul. 27, 1976, Pat. No. 4,042,201. This application Jun. 27, 1977, Ser. No. 810,031

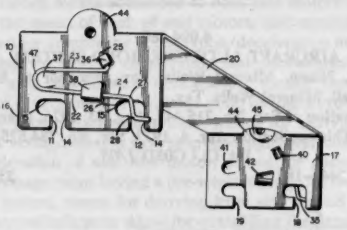
Int. Cl.[2] B60R *11/02*

U.S. Cl. 248—221.3 **8 Claims**

1. A bracket for mounting electronic equipment in a vehicle comprising:

(a) a U-shaped bracket having a first slot and a second slot in each upright of the "U" for receiving mounting studs attached to opposite sides of an equipment unit, each slots having an entrance at one end of an entrance leg and a foot formed substantially perpendicular to the other end of said leg so as to form an "L" shape;

(b) at least one wire spring element bent in a semicircle at a first punched tab in a respective said upright having an upper arm extending to a second bend about a second punched tab and having a lower arm extending through a double bend to block said first slot; and,



(c) a third punched tab providing upward support for said lower arm; all whereby said spring element resists passage of equipment mounting studs into said first slot and then snaps behind it as it moves into the foot of the first slot to secure said equipment unit in place.

4,094,486

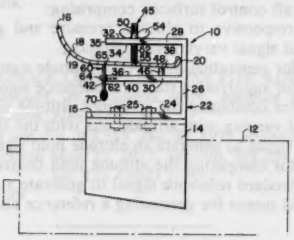
CB RADIO MOUNTING BRACKET

Frank Sunderlin, Rte. 1, Box 120A, Pickens, S.C. 29671

Filed Nov. 2, 1976, Ser. No. 738,248

Int. Cl.[2] A47F *5/00*

U.S. Cl. 248—225.4 **9 Claims**



1. A mounting bracket for use in a motor vehicle for securing a CB or the like to the upper and lower sides of a dashboard, said mounting bracket comprising:

a. a housing member including:

(1) a base adapted to be secure to the CB or the like,

(2) a wall extending upwardly from said base,

(3) An upper rail extending outwardly from said wall in substantially overlapping relationship to said base, and

(4) a lower rail extending outwardly from said wall intermediate and in substantially overlapping relationship to said upper rail and said base and terminating in a front end, the dashboard adapted to extend within the channel formed between said rails and beyond said front end,

b. mounting means operatively associated with said rails in said channel to provide the necessary suspension of the mounting bracket relative to the dashboard, said mounting means including:

(1) a pair of spaced apart protrusion extending upwardly from said lower rail into said channel and proximate said wall for engagement with the lower side of the dashboard, and

(2) a pair of spaced apart adjustable prongs extending downwardly from said upper rail into said channel and outwardly of said protrusions, said prongs adapted to engage the upperside of the dashboard so as to engage same, each said prong having a threaded stud extending in threaded engagement through said upper rail and a

wing nut thereon to adjust the extension of said prong within said channel,

c. locking means mounted outwardly of said prongs on said lower rail and including a pair of levers pivotally mounted intermediate their ends to said lower rail so that in a locking position a forward end of each lever extends above said lower rail and a rear end of said lever extends below said lower rail, each of said levers being individually manually operable between a locking position in which the forward end thereof engages the lower side of the dashboard to be clamped in locked position between each said prong providing a downward clamping force and each said protrusion and lever providing an upward clamping force, to a release position in which each said lever is disengaged from contacting engagement with the dashboard.

4,094,487

SECURING DEVICE

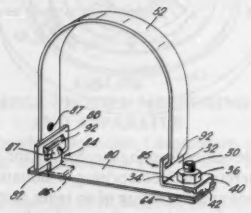
Robert Arthur Henderson Heard, Church Farm, 63 Church Lane, Backwell, Bristol, England

Filed Jun. 14, 1976, Ser. No. 695,411

Claims priority, application United Kingdom, Jun. 16, 1975, 25618/75

Int. Cl.[2] E01F *9/01*

U.S. Cl. 248—231 **5 Claims**



1. A device for securing a first body to a second body, the second body comprising a channel member having a mouth restricted by inturned lips, the device comprising an elongate plate for insertion lengthwise into the channel to extend across its mouth and be retained in the channel by the inturned lips thereof, a pair of attachment members arranged for connection to the elongate member through the mouth of the channel and connected or arranged for connection to a strap to be passed around the first body, one of the attachment members comprising a flat body part slotted to receive said strap and a narrower stem part to extend through the channel mouth and being connected at its end remote from the body part to an end portion of the elongate plate, the other attachment member being of L-shaped configuration comprising a first limb connected or arranged for connection to said strap and a second limb at right angles thereto with an aperture therein, a nut and bolt adjustably connecting said second limb with the adjacent end portion of the elongate plate so that the shank of the bolt extends through the channel mouth, the shank of the bolt passing through an aperture in the elongate plate and the aperture in said second limb, the head of the bolt lying on the side of the elongate plate remote from said second limb and the nut being carried on the shank on the side of said second limb remote from the elongate plate.

4,094,488

HANGER FOR TENNIS RACKETS

Neil Bryant, 2800 Crouchwood, Little Rock, Ark. 72207

Filed Aug. 8, 1977, Ser. No. 822,803

Int. Cl.[2] A47G *29/00*

U.S. Cl. 248—359 **6 Claims**

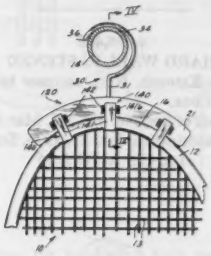
1. An article for hanging a game racket in a clothes closet on a horizontal bar therein, the racket having a curved frame with an open face across which strings are tautly strung at spaced intervals, the article comprising:

a body having upper and lower edges and opposite side walls therebetween,

the lower edge of the body having surfaces conforming to an upper, outer portion of the racket frame;

an open hook affixed to the upper side of the body and extending upwardly therefrom for engaging over said bar of said closet; and

at least one flexible strap member affixed to one of the walls and edges of the body and having means thereon for



removably engaging one of the frame and face of the racket,

the said flexible strap and engagement means thereon comprise one part of a two-part synthetic sheet-form material, the parts of which are removably adhesvie to one another upon pressing, facial contact together; and

a second flexible strap comprising a second part of said two-part tape material is affixed to the body in alignment with the first strap along the face of the racket, for engagement with the racket face and the first strap through the racket face.

4,094,489

SEAT POSITION ADJUSTING MEANS FOR AUTOMOBILE SEAT ASSEMBLIES

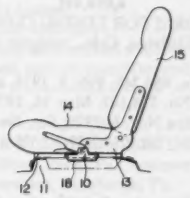
Noboru Yoshimura, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 29, 1976, Ser. No. 745,976

Claims priority, application Japan, Dec. 9, 1975, 50-146730

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—429 **6 Claims**



1. Seat position adjusting means for an automobile seat assembly, which comprises rail means provided on a floor of an automobile body and having a plurality of recesses arranged at least in one row, bracket means slidable along said rail means and carrying seat means thereon, locking means provided on said bracket means and including locking elements which are resiliently biased into locking engagement with said recesses in said rail means, adjusting lever means mounted on said bracket means for swinging movement about a first axis, means for interconnecting said adjusting lever means with said locking elements in such a manner that at least one of the locking elements is moved out of engagement from one of the recesses in the rail means when said lever means is swingably actuated

in at least one direction, and outrigger elements mounted on said lever means for swinging movement about a second axis which is offset from said first axis, said outrigger elements being resiliently biased into engagement with another of said recesses in the rail means whereby, when said lever means is actuated to disengage said one of the locking elements from said one of said recesses in the rail means, one of the outrigger elements functions as a fulcrum member for supporting said second axis against displacement so as to cause a predetermined displacement of the first axis with respect to said rail means for producing a corresponding displacement of the bracket means.

4,094,490

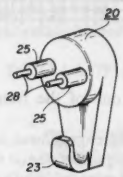
HARD WALL FASTENER

Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 555,737, Mar. 6, 1975, Pat. No. 3,974,557. This application Jun. 21, 1976, Ser. No. 698,069

Int. Cl.² A47G *1/16*

U.S. Cl. 248—489 **17 Claims**



1. In an article of the type having a base member with a first surface adapted to engage a wall, and at least one hardened pin with a sharpened end initially extending into an aperture in the base member from a surface opposite said first surface and a driving end extending from said opposite surface, whereby said pin may be driven into a wall for supporting said article on the wall; the improvement wherein said article further comprises a bushing mounted to support said pin in said aperture, said bushing being releasably coaxially held in said aperture, with one end thereof in said aperture and spaced from said first surface and the other end extending from said opposite surface, said bushing having a central coaxial hole into which said pin extends whereby said bushing guides said pin in said aperture, said bushing having a length less than the length of said pin.

4,094,491

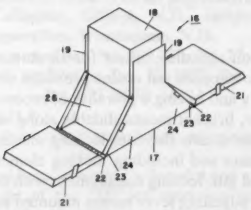
CORE FORM FOR LINING CONTAINERS

Jack E. Towers, Littleton, Colo., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 656,245, Feb. 9, 1976, abandoned, which is a division of Ser. No. 578,102, May 16, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,073

Int. Cl.² B29C *1/06*

U.S. Cl. 249—83 **1 Claim**



1. A mold for applying a foamable resilient material to the interior surfaces of a container, comprising a base, a center portion centrally mounted on the base, the base having opposed wedge-shaped end sections, each end section defining an inclined portion which inclines from the center portion; two side walls fixedly mounted on the sides of the base and in spaced apart relationship with the center portion; an end flap hingedly affixed to each of the ends of the end sections, pivotable on a hinge and capable of being removably secured to the inclined portion of each of the end sections; each end section further having a recess between the sides thereof, wherein the end flap holds the lid of the container over the recess so that the foamable resilient material substantially fills the recess under the lid to adhere to the interior side of the container lid.

4,094,492

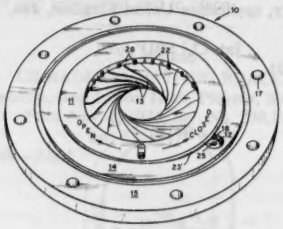
VARIABLE ORIFICE USING AN IRIS SHUTTER

Raymond Beeman, El Cerrito, and Steven J. Brajkovich, Fremont, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 18, 1977, Ser. No. 760,305

Int. Cl.² F16K *31/54, 3/06*

U.S. Cl. 251—212 **4 Claims**



1. A variable orifice forming mechanism for controlling flow of medium therethrough comprising: a mounting ring defining a central orifice and consisting of an inner section, an intermediate section, and an outer section, a plurality of curved members pivotally mounted on said mounting ring, said inner section of said mounting ring having a plurality of spaced holes therein, said curved members each having an extending pivot pin located at one end thereof positioned in one of said holes, said intermediate section of said mounting ring having a thickness greater than said inner section and having a countersink therein, and said outer section of said mounting ring having a thickness greater than said intermediate section and being provided with means by which said mechanism is adapted to be secured to an associated system through which medium to be controlled flows, a drive ring having a plurality of grooves therein, said drive ring being positioned on said inner section of said mounting ring, said curved members having pins extending therefrom and movably secured in said grooves of said drive ring, and drive means mounted in said countersink of said intermediate section of said mounting ring for moving said drive ring with respect to said mounting ring thereby moving said curved members such that said orifice in said mounting ring is effectively changed in diameter.

4,094,493

GANTRY CRANES

Karl L. Polen, Alliance, Ohio, assignor to The Alliance Machine Company, Alliance, Ohio

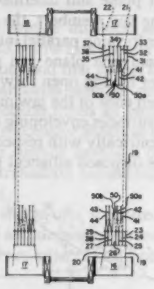
Division of Ser. No. 637,230, Dec. 3, 1975, Pat. No. 4,027,800. This application Jan. 5, 1977, Ser. No. 757,059

Int. Cl.² B66C *23/60*

U.S. Cl. 254—144 **3 Claims**

1. A safety reeving system for gantry cranes comprising a pair of drums on each end of said gantry, an upper sheave assembly on the gantry above each drum, each drum having a pair of independent cables reeving from the drum to said upper sheave assembly above it on the gantry, a lower relatively

movable sheave assembly below each upper sheave assembly, one cable from each pair of cables passing over one sheave of the upper sheave assembly and downward around the lower sheave assembly and back over the upper sheave assembly and dead ending at the lower sheave assembly, the other cable from



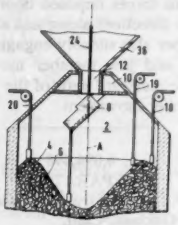
each pair of cables passing over a sheave of the upper sheave assembly across the gantry to the opposite upper sheave assembly on the other side of said gantry and downwardly to the lower sheave assembly on said other side and back over the said opposite upper sheave assembly and dead ending at the said opposite lower sheave assembly.

4,094,494

FURNACE CHARGE PROFILE MEASURING PROCESS AND APPARATUS

René N. Mahr, Howald-Hesperange, Luxembourg, assignor to S. A. des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed Jan. 25, 1977, Ser. No. 762,781
Claims priority, application Luxembourg, Feb. 9, 1976, 74321
Int. Cl.² C21B *7/24*
U.S. Cl. 266—44 **1 Claim**



1. A process for monitoring the development of the surface of the charge burden on the hearth of a shaft furnace, the furnace employing a rotatable and angularly adjustable distribution chute which extends downwardly on the axis of the furnace, the angle of the chute with respect to the axis of the furnace being adjustable to deposit furnace charge material in a predetermined pattern, said process including the steps of:

inclining the distribution chute such that its axis is at a preselected angle with respect to the axis of the furnace;

lowering a probe initially axially with respect to the furnace until it contacts the charge surface, the probe being deflected from the furnace axis by the distribution chute;

measuring the distance traveled by the probe until contact with the charge surface has been established;

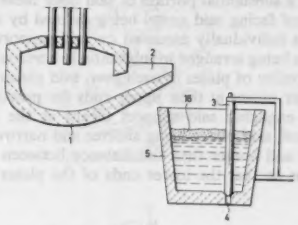
correcting the measured distance in accordance with the angular inclination of the distribution chute; and withdrawing the probe from the charge surface.

4,094,495

METHOD AND APPARATUS FOR THE PRODUCTION OF QUALITY STEELS

Horst Kutscher, Dortmund, and Gernot Zahs, Dortmund-Lichtendorf, both of Germany, assignors to Vacmetal Gesellschaft fur Vakuum'-Metallurgie mbH, Dortmund, Germany

Filed Apr. 22, 1976, Ser. No. 679,118
Claims priority, application Germany, May 17, 1975, 2522194
Int. Cl.² C21B *13/14*
U.S. Cl. 266—143 **7 Claims**



1. An installation for producing high quality steels with analyses within a very close range of tolerances from solid raw materials comprising:

a furnace including heating means by which the raw materials are melted down and at least partially decarburized and dephosphorized and the resulting melt is heated to metal;

a transfer ladle positioned to receive the melt produced in said furnace, said transfer ladle including means to discharge the metal;

means to separate the slag component from the said metal component of said melt; a receiving ladle positioned to receive the metal component of said melt, discharged from said transfer ladle;

means to agitate a melt contained in said receiving ladle;

a transporting unit by which said receiving ladle and its contents is moved to a plurality of locations at which it is selectively engaged in a vacuum tight relationship with one of the following:

(a) a hood under which vacuum treatment and degassing may be effected;

(b) a vacuum lifter through which alloying additions can be made while the contents of said receiving ladle remains under a vacuum; and

(c) a heating unit under which said receiving ladle and its contents may be heated;

a vacuum producing unit; and

means to operatively connect said vacuum producing unit to each of said hood, said vacuum lifter and said heating unit.

4,094,496

ENCLOSURE FOR STEEL CONVERTING APPARATUS

John P. Readal, Allison Park, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Dec. 31, 1975, Ser. No. 645,535
Int. Cl.² C21C *5/46*
U.S. Cl. 266—142 **2 Claims**

1. A converter vessel having a metal receiving opening formed adjacent an upper end,

an enclosure having an upper wall portion disposed above said vessel and side wall portions extending downwardly along the sides of said vessel,

an access opening formed in one of said wall portions, door means mounted adjacent said access opening for movement into open and closed positions relative to said access opening,

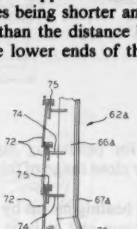
said vessel being mounted for pivotal movement toward and away from the access opening to permit the charging thereof,

said vessel having submerged tuyeres for injecting oxygen and a hydrocarbon shielding fluid beneath the level of molten metal in said vessel and for injecting non-oxidizing gases into said metal when it is tilted toward said door means, said gas injections tending to cause materials to discharge from said metal receiving opening and to coat said door means,

the improvement wherein:

said door means including a plurality of generally horizontally oriented support means disposed in vertically spaced relation,

at least a substantial portion of said door means on the side thereof facing said vessel being defined by a plurality of plates individually mounted on said support means, said plates being arranged in substantially horizontal rows with a plurality of plates in each row, said plates each having hanger means at their upper ends for pivotally and slidably engaging said support means as the sole support thereof, said plates being shorter and narrower than said door and longer than the distance between said support means so that the lower ends of the plates overlap and



loosely engage the upper end of the plate disposed in the row therebelow to cover the hanger means thereon, the surfaces of said plates presented to the vessel being free of projections,

said plates being formed of a ferrous material having a carbon content substantially higher than steel and are individually pivotal and slidable so that each plate may be moved relative to adjacent plates to facilitate the removal of material briding the plates,

said support means each comprising a plurality of members mounted on said door means and extending in parallel spaced apart relation, each of the plates in said rows being mounted on one of said members,

said hanger means comprising first hook means extending over said support means,

the lower portion of said door means extending obliquely outwardly away from said access opening, the lower ones of said rows of plates defining the lower portion of said door means, each of the plates in said lower rows having a second hook means formed thereon and engaging the plate in the row disposed therebelow and to limit movement away from said lower plate.

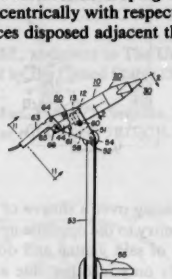
4,094,497

VISE FOR FLY TYING, SMALL PARTS AND THE LIKE

Paul E. Stratton, R.R. #1, Box 220, Fairfax, Iowa 52228

Filed Dec. 27, 1977, Ser. No. 864,276
Int. Cl.² B25B *1/22*
U.S. Cl. 269—71 **10 Claims**

1. In a vise having a pair of jaws, means for actuating the jaws in order to selectively hold and release a workpiece, and means for mounting the vise, the improvement wherein: the jaws comprise a pair of finger-like jaw members having corresponding forward and rearward ends and corresponding opposed interior surfaces and corresponding opposite exterior surfaces symmetrically disposed with respect to a longitudinal axis therebetween, said interior surfaces of the jaw members including two sets of opposing faces, the first set extending parallel to each other rearwardly from the forward ends of the jaw members and consitituting workpiece gripping faces of the jaws, the second set of faces diverging rearwardly from the rear ends of the first set of faces, the first and second sets of faces being symmetrically disposed with respect to a first plane through said axis, said exterior surfaces of the jaw members including a third set of faces symmetrically disposed with respect to said first plane and intermediate the forward and rearward ends of the jaw members, the second and third faces of each jaw member forming parallel intersections with second planes normal to said first plane and parallel to said axis; a hollow nose member having open forward and rearward ends corresponding to said ends of the jaw members, the nose member having interior surfaces enveloping exterior surfaces of the jaw members concentrically with respect to said axis including a fourth set of faces disposed adjacent the forward end of the



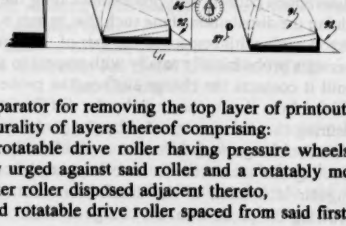
nose member and complementary with the third set of faces; a jaw guide member extending between and fixed in opposite wall portions of the nose member rearward of its forward end, the guide member intersecting said first axis and having exterior surfaces disposed between the second set of faces; exterior surfaces of the jaw members including the third set of faces and interior surfaces of the nose member including the fourth set of faces respectively slidably engaging each other during conjoint movement of the jaw members in forward and rearward directions in response to forces imposed upon the rearward ends thereof in opposite directions along said axis, exterior surfaces of the guide member also slidably engaging the second set of faces throughout said jaw member movement; and means associated with the rearward ends of the jaw member to provide said jaw member movement.

4,094,498

SEPARATOR

Marlin A. Schueler, San Leandro, Calif., assignor to Tion Equipment Company, Oakland, Calif.

Filed Jul. 22, 1977, Ser. No. 818,074
Int. Cl.² B65H *41/00*
U.S. Cl. 270—52.5 **8 Claims**



1. A separator for removing the top layer of printout paper from a plurality of layers thereof comprising:

a first rotatable drive roller having pressure wheels resiliently urged against said roller and a rotatably mounted breaker roller disposed adjacent thereto,

a second rotatable drive roller spaced from said first roller

for defining a first folding station therebetween and having pressure wheels resiliently urged against said second roller,

a rotatably driven fork structure including at least two adjacent parallel tines disposed intermediate and parallel to said first and second rollers above said first folding station, and

at least one folding wedge disposed at a second folding station adjacent and below said second roller on the opposite side thereof from said first roller, said wedge being in the form of a tetrahedron wherein one of the triangular faces of the tetrahedron forms an inclined upper surface for supporting the successive sheets as they are refolded in a stack, said upper surface having a common edge with the base of the tetrahedron substantially parallel to said second drive roller,

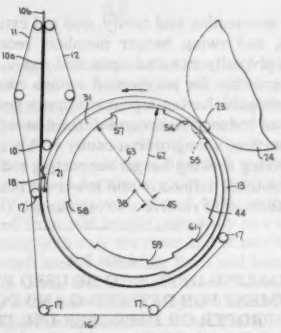
whereby successive sheets of a separated layer of printout paper are refolded and deposited on said triangular upper surface with fold lines adjacent said common edge.

4,094,499

DEVICE FOR CONTROLLING THE ACTUATION OF GRIPPING MEANS IN A SHEET ASSEMBLING APPARATUS

Hermann Thomas, Darmstadt, Germany, assignor to Maschinenfabrik Goebel GmbH, Darmstadt, Germany

Filed Nov. 2, 1976, Ser. No. 738,268
Claims priority, application Germany, Nov. 6, 1975, 2549761
Int. Cl.[2] B65H *39/08*
U.S. Cl. 270—60 **4 Claims**



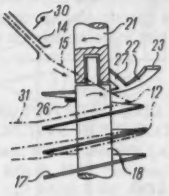
1. In an apparatus for assembling sheets which comprises a cylinder mounted for rotation about its axis and having a sheet gripping means thereon for holding at least one sheet thereon and for releasing the sheet for passage onto a sheet handling means, the gripping means connected to a follower roll in engagement with a stantionary cam plate having a predetermined profile for effecting actuation of the gripping means as the follower roll engages a depressed portion of the cam plate, a device for further controlling the actuation of the gripping means comprising, a rotatable cam plate eccentrically mounted relative to the cylinder axis, the rotatable cam plate having a profile for preventing actuation of the gripping means when the follower roll simultaneously engages at least one portion of the rotatable cam plate which may overlie a depressed portion of said stationary cam plate and thereby preventing said follower roll from following the profile of the stantionary cam plate, said rotatable cam plate being mounted for rotation about the cylinder axis independent of said stationary cam plate and the cylinder, means for rotating said rotatable cam plate to alter the phase of the rotatable cam plate relative to the cylinder during rotation, and to effect movement of the portion of the rotatable cam plate into and out of an overlying position relative to said depressed portion.

4,094,500

APPARATUS FOR THE FOLDING OF PAPER WEBS OR SIMILAR MATERIALS

Otto Kunzmann, Neuffen, Germany, assignor to Bielomatik Leuze & Co., Neuffen, Germany

Filed Oct. 29, 1976, Ser. No. 736,800
Claims priority, application Germany, Nov. 12, 1975, 2550759
Int. Cl.[2] B65H *45/20*
U.S. Cl. 270—79 **20 Claims**



1. An apparatus for the folding of paper webs or similar materials for the formation of a stack made up of folded layers, comprising:

an arm for laying out the layers to form the stack, the laying arm being adapted for substantially cyclical, oscillatory motion, each of said layers being formed by one half-cycle of said cyclical motion, successive topmost layers being formed during each of said half-cycles as said webs leave said arm, each of said topmost layers having an upper surface directed away from said stack;

at least one folding screw which, in use, is located in the region of a corner of the stack having an axis of rotation extending substantially perpendicularly to the plane of the layers and having a leading edge for first engaging said webs, the leading edge entering the stack from the inside thereof between layers to be folded, the at least one folding screw being adapted to rotate twice for each said oscillatory cycle of the laying arm;

means for rotating the at least one folding screw in one direction; and

a pressing-down element mounted for rotation in the opposite direction to the at least one folding screw about an axis of rotation extending substantially perpendicularly to the plane of the layers and arranged to act upon each of said upper surfaces, so as to vertically position the web below the leading edge of the at least one folding screw, in the region where the leading edge enters in between the layers, the at least one folding screw preventing movement of the folded layers toward the middle of the stack.

4,094,501

ILLUSION APPARATUS

Edward D. Burnett, 3945-A W. Ainslie, Chicago, Ill. 60625

Filed Dec. 13, 1976, Ser. No. 750,282
Int. Cl.[2] A63J *5/02*
U.S. Cl. 272—8 M **1 Claim**

1. A fish bowl optical illusion apparatus wherein an image is made to appear in a liquid-filled container, wherein the improvement comprises

(a) a compartment having front, back and side walls and a partial top wall providing a partially open top for the compartment,

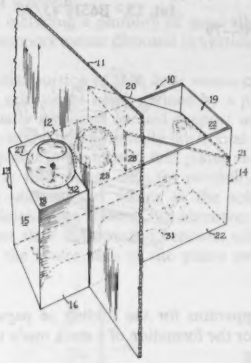
(b) an opaque wall member providing an opening of a size equal to the height and width of the compartment so as to receive a portion of the compartment therethrough,

(c) an opaque stand provided by a part of said partial top wall of said compartment projecting through said opening formed in said opaque wall member,

(d) a reflective surface angularly positioned over said partially open top of said compartment on one side of said wall member and adapted to reflect an image of the con-

tents within said compartment below said reflective surface in the direction of said wall member,

(e) a pair of circular liquid-filled transparent receptacles supported in horizontal alignment on said stand to either side of said opaque wall member in the path of reflection of said reflective surface, and



(f) a second opening in said wall member in the line of the reflected image from said reflective surface and adapted to substantially receive a portion of one of said liquid-filled receptacle positioned upon said stand on the other side of said wall member and in which appears the reflected image of the contents of said compartment.

4,094,502

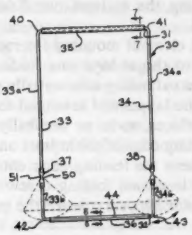
SKIPPING EXERCISE DEVICE

Arthur W. Cook, 822 Roosevelt St., Lima, Ohio 45804

Filed Feb. 7, 1977, Ser. No. 766,189

Int. Cl.[2] A63B *5/22*

U.S. Cl. 272—74 **9 Claims**



1. A skipping exercise device comprising a rectangular frame having two rigid long sides and two rigid short sides, a first of said short sides having means defining a handle, and hinge means located at a fixed predetermined point in each long side, said predetermined points being equally spaced from the second of said short sides a distance of from one-third to one-ninth the length of said long sides, said hinge means permitting said second short side to swing about said predetermined points in said long sides.

4,094,503

PLAYGROUND SWING WITH EXTRUDED CROSSBAR

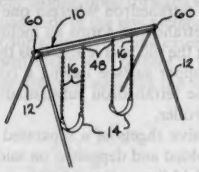
Robert S. Wormser, 6900 SW. 19th Ave., Ocala, Fla. 32670

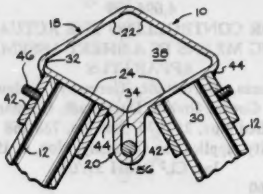
Filed Mar. 30, 1977, Ser. No. 782,892

Int. Cl.[2] A63G *9/00*

U.S. Cl. 272—85 **12 Claims**

1. In a playground swing including a crossbar supported upon leg columns affixed to the crossbar and angularly extending therefrom and swing members suspended from the crossbar having hanger members pivotally connected thereto, the improvement comprising said cross bar constituting an elongated hollow body having ends, an interior cavity, exterior sides to which the leg columns may be attached and a lower portion, said lower portion also having an interior cavity extending longitudinally therealong, an elongated pivot rod within said cavity of said body lower portion, rod restraining means within said body cavity engaging said rod preventing lateral rod displacement within said body lower portion cavity, a plurality of transverse notches defined in said body lower





portion intersecting said cavity, said rod extending across said notches, and swing hanger members received within said notches pivotally mounted upon said rod.

9. A crossbar for playground swings comprising a hollow metal extrusion having a primary upper portion and a lower portion of reduced transverse dimension with respect to said upper portion, a longitudinal cavity within said lower portion for receiving a swing hanger supporting rod, and longitudinal spaced notches defined in said lower portion intersecting said cavity adapted to receive a swing hanger.

4,094,504

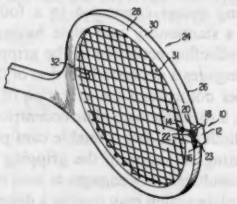
SIGNALLING DEVICE TO BE USED WITH A SPORT IMPLEMENT FOR DETECTING AND INDICATING THE PROPER OR IMPROPER USE THEREOF

Kenneth S. Barasch, 380 Lenox Ave., South Orange, N.J. 07079

Filed Mar. 3, 1976, Ser. No. 663,623

Int. Cl.[2] A63B *69/38*

U.S. Cl. 273—29 A **2 Claims**



1. A signalling device in combination with a tennis racquet for detecting and indicating the proper or improper use thereof, comprising:

air-actuable means comprising a plurality of reed members, each said reed member having a longitudinal axis, for emitting an audible signal when air passes through said means in a predetermined manner;

some of said reed members being mounted on said tennis

racquet in a first direction so as to indicate a proper forehand stroke of said tennis racquet and other ones of said reed members being mounted on said tennis racquet in a direction opposite said first direction so as to indicate a proper backhand stroke of said tennis racquet; said proper stroke being indicated by said reed members when said longitudinal axis is moved parallel to the direction of said forehand and backhand stroke of said tennis racquet; and

means mounting said reed members to said tennis racquet.

4,094,505

TENNIS RACKET

Thomas E. Beall, Jr., 5350 Edgemoor La., Bethesda, Md. 20014

Filed Jan. 4, 1977, Ser. No. 756,798
Int. Cl.² A63B *49/02*
U.S. Cl. 273—73 C **9 Claims**

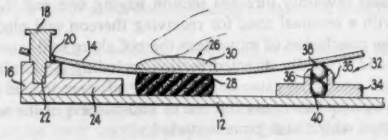
1. A racket, having orientations of an inner end toward the player and an outer end away from the player comprising: a rigid handle having a gripping surface to be held by the player; a bow having opposed sides and opposed inner and outer ends; main strings strung from end to end of said bow and cross-strings strung side to side on said bow; first shaft means extending cantilevered from said handle to a direct mechanical connection with only the inner end of said bow; second shaft means cantilevered from said handle outwardly to a mechanical direct connection with only the outer end of said bow; said first and second shaft means extending from said handle independently of each other to flex as cantilevered beams separately according to forces exerted only at their outer ends through their respective mechanical connection to the inner and outer ends of said bow; and each of said first and second shaft means being unconnected to and freely movable with respect to said opposed bow sides.

4,094,506

COMPETITIVE GAME

Howard J. Morrison, Deerfield, and Alan A. Hicks, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed May 23, 1977, Ser. No. 799,706
Int. Cl.² A63F *7/06, 7/10, 9/00*
U.S. Cl. 273—85 R **19 Claims**



1. A game apparatus comprising:

means for defining a relatively flat playing surface;

flexible cover means spaced above said playing surface and deflectable downwardly;

resilient support means for normally supporting said cover means at a preselected spacing above said playing surface and compressible to provide reduced spacing between said cover means and said playing surface on downward deflection of said cover means; and

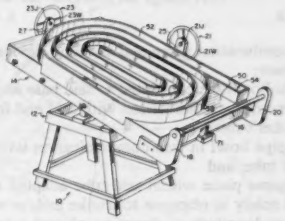
a playing piece mounted for movement over said playing surface between said playing surface and said flexible cover means, said piece including means engageable by said cover means when deflected downwardly for propelling said piece across said playing surface in a direction determined by the deflection of said cover means.

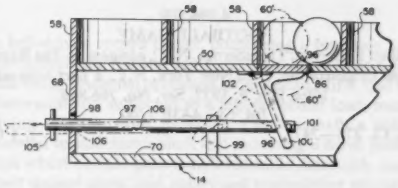
4,094,507

CHANNELED PIVOTING BALL GAME WITH SELECTIVE HOLE CLOSURE

Russell E. Kauffmann, 1604 Executive La., Glenview, Ill. 60025

Filed Feb. 9, 1977, Ser. No. 766,860
Int. Cl.² A63F *7/04;* A63B *71/04*
U.S. Cl. 273—110 **2 Claims**





1. A rolling ball game apparatus comprising in combination,

a table top height unit having an upper surface of approximately rectangular overall shape and on which is defined spaced apart walls which form a continuous spiralling track from a start position to a finish position, said track being sized such that it is generally wider than the ball so that the ball may roll over different paths while proceeding along the track;

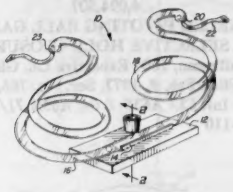
means for mounting the table top height unit at that height such that the unit may be tipped about a central area in any direction and its strike plane changed, and manual grip means for allowing one or more players to control the dip and strike of the table unit;

said table top unit surface also defining a plurality of hazard holes spaced about the track and so sized as to allow a ball to fall through them and positioned such as to allow a ball to travel past the hole without falling in it;

means provided in the unit for selectively closing alternatively one or more different ones of the plurality of holes such that a ball will roll over the closed holes without material interuption, said means being selectively manually operable from the edge of the unit to alternatively latch in the closed or open position the selected hole or holes

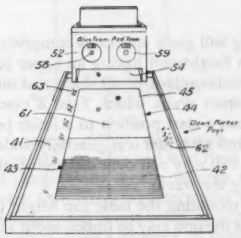
whereby one or more players may attempt to control the dip and strike of the table top height unit to maneuver a ball past hazard holes and along the spiralling track from start to finish, and the game's difficulty may be increased by alternatively manually latching in the closed or open position the selected hole or holes.

4,094,508
COMBINATION PIPE AND GAME DEVICE
Daniel D. Kirsch, 4734 N. 79th Ave., Phoenix, Ariz. 85033
Filed May 21, 1976, Ser. No. 688,581
Int. Cl.[2] A63F *7/00*; A24F *3/00, 1/16*; A63H *33/28*
U.S. Cl. 273—118 R **5 Claims**



1. A combination game and smoking device comprising:
(a) a base;
(b) a hollow tube connected to said base and having an end;
(c) a mouthpiece associated with said end for reception in a smoker's mouth;
(d) a pipe bowl in free communication with the interior of said tube; and
(e) a game piece within said tube adapted to move therein and solely in response to smoke and/or air movement in either longitudinal direction of said tube and being selected to permit passage of smoke through the tube in all positions thereof.

4,094,509
FOOTBALL GAME
William F. Barron, Ticonderoga, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Feb. 9, 1977, Ser. No. 766,866
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—247 **1 Claim**



1. A football game, comprising
a gameboard providing a miniature football field having a plurality of spaced parallel yard lines and side lines and a plurality of peg holes down the center of the field and along one of the side lines, holes being provided at each yard line;
a football shaped peg of a first color adapted to removably fit in the peg holes;
a football shaped peg of a second different color adapted to removably fit in the peg holes;
a plurality of pegs of a third different color adapted to removably fit in the peg holes;
a dice box extending substantially perpendicularly from one end of the gameboard and having a chute formed therein and opening at the surface of the gameboard, said dice box having a side facing the field and extending substantially parallel to the yard lines, said dice box having a dimension substantially parallel to said yard lines which is greater than the width of the field and smaller than the width of the gameboard, the opening of the chute being greater than the width of the field;
a plurality of dice of the first color and a plurality of dice of the second color;
a plurality of play cards indicating various offensive plays and all types of playing variations which occur in a football game whereby a player rolls a predetermined number of the dice of one of the colors into the chute of the dice box via the opening thereof to determine a yardage gain or loss after referring to a play card to determine his play, the player placing the football peg on the correct yard line in the center of the field and the side line peg on the same yard line as the football peg to mark the line of scrimmage before the next play is called; and
a pair of scoring wheels on the side of the dice box facing the field, each of the scoring wheels being of a corresponding one of the first and second colors.

4,094,510
TELL IT TO THE JUDGE GAME
Walter Drohomirecky, 164 Fifth St., Rankin, Pa. 15104
Filed Nov. 5, 1976, Ser. No. 739,114
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—251 **4 Claims**

1. A game adapted to increase appreciation of the meaning of actual traffic road signs and that there are penalties for disobeying the signs, said game comprising in combination:
A. a plurality of pieces at least one for each player of the game,
B. a game board having a playing surface upon which said playing pieces are supportable,
C. said game board having its periphery divided into a roadway having a continuous right lane and a continuous left lane, said lanes being adjacent to each other and extending about said board so as to provide two paths of travel for the movement of said playing pieces in the same direction from the beginning to the end of each of said lanes, each said lane affording a path of progression for the purpose of continuity of play and including a series of distinguishable zones on each of said lanes,
D. said game board is generally square in configuration with said lanes of progression arranged about the periphery of said board to form a generally square closed figure of four sides with a particular location in one of said corners of the square from which said game is started,
E. said lanes extending in substantially parallel spaced relationship to each other and terminating in an inwardly directed section prior to closing of said square, such that said periphery of said game board is traveled by said pieces along said lanes prior to reaching said inwardly directed section,
F. a pair of starting zones in said corner of the square from which said game is started, one of said starting zones positioned adjacent to said right lane and the other of said starting zones adjacent to said left lane,
G. said inwardly directed section having one end thereof with a terminal zone for receiving thereon said pieces at the conclusion of movement thereof along said lanes,
H. said inwardly directed section including a plurality of said zones and extending in a plane adjacent to said roadway at substantially the one of said corners of the square from which said game is started,
I. traffic designations bearing different indicia thereon representative of road signs having varying identification indicia thereon along each of said lanes in a plurality of said

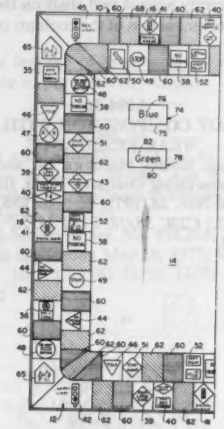
zones, certain of said traffic designations providing for the crossing of said pieces between said lanes,

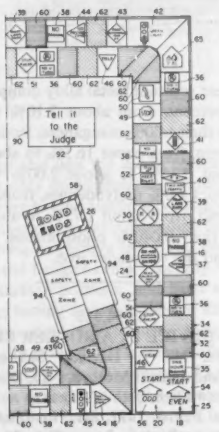
J. first identifiable means distinguishable by the color thereof, being interspersed among said signs along each of said lanes in a plurality of said zones,

K. second identifiable means distinguishable by the color thereof, being interspersed among said signs and said first identifiable means in a plurality of said zones,

L. a chance device operable by players of said game apparatus for determining the possible odd or even number of zones a particular playing piece shall move along the playing surface of said lanes,

M. odd indicium in one of said starting zones and even





indicium in the other of said starting zones, so as to commence play of the game with each one of said pieces on one of said lanes depending if an even or odd number is obtained by said chance device,

N. a first set of cards corresponding to said first identifiable means,

O. a second set of cards corresponding to said second identifiable means,

P. a set of chance cards, each said chance card having indicia thereon representative of an advantage one player must exercise over another player or a hazard that a player must suffer relative to the movement of said pieces along said lanes,

Q. said chance cards selected by a player when a preselected number of said first set of cards are accumulated by a player by landings on said zones of said first identifiable means and which are equivalent to traffic violations, or a preselected number of said second set of cards are accumulated by a player by landings on said zones of said second identifiable means and which are equivalent to traffic violations,

R. first positioning means on said game board for placing said first set of cards corresponding to said first identifiable means,

S. second positioning means on said game board for placing said second set of cards corresponding to said second identifiable means, and

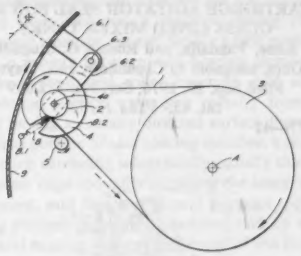
T. chance positioning means on said game board for placing said set of said chance cards thereon.

4,094,511

BELT-DRIVEN RECORD PLAYER

Erhard Richter, and Dietrich Borsum, both of Kiel, Germany, assignors to Electroacustic GmbH, Kiel, Germany

Filed Feb. 25, 1976, Ser. No. 661,336
Claims priority, application Germany, Mar. 21, 1975, 2512403
Int. Cl.[2] G11B *3/60;* F16H *7/10*
U.S. Cl. 274—39 A **6 Claims**



1. A belt-driven record player, comprising a turntable having a circumferential rim and being rotatable about an axis, said turntable being in normal operation subjected to a first load but being intermittently subjected to a higher second load; means for driving said turntable, including a motor shaft, a pulley shaft parallel to said motor shaft and mounting a drive pulley, a friction wheel on said pulley shaft rotatable therewith, and a drive belt trained about said pulley and transmitting torque to said turntable; and means responsive to changes in the load acting upon said turntable and mounting said pulley shaft for displacement in parallelism with said axis between a first position which it assumes when said first load acts upon said turntable and in which said friction wheel functionally engages said motor shaft but is spaced from said rim so that torque is transmitted to said turntable only via said drive belt, and a second position which said pulley shaft assumes when said second load acts upon said turntable and in which said friction wheel frictionally engages both said motor shaft and said rim so that torque is transmitted to said turntable via said drive belt as well as directly via said friction wheel to said rim.

4,094,512

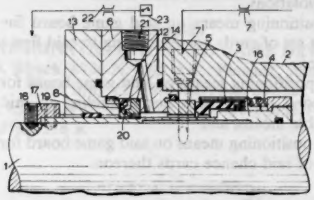
SHAFT SEALS

Anthony Charles Back, Slough, England, assignor to Crane Packing Limited, Slough, England

Filed Jul. 14, 1976, Ser. No. 705,154
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—27 **11 Claims**

1. A seal assembly between first and second relatively rotatable elements, said assembly comprising an external cylindrical surface on said first element, a ring of flexible material which is free to float axially on said cylindrical surface, said ring having inner and outer annular lips both directed in the same axial direction, an internal cylindrical surface in said second

element disposed around said ring, said lips being capable of engaging and sealing respectively against the external cylindrical surface on said first element and against the internal cylindrical surface in said second element, the dimensions being such that in its free condition, said ring is normally out



of contact with at least one of said surfaces but comes into contact with both, to form a seal, when fluid pressure acts against that axial face of the ring which faces in the direction towards which said lips are directed.

4,094,513

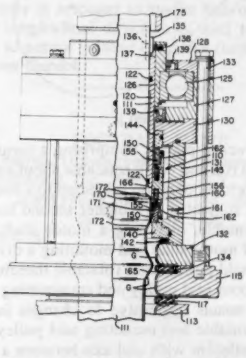
FULLY CARTRIDGE AGITATOR SEAL FOR USE WITH GLASS LINED MIXER TANKS

Donald L. Kime, Vandalia, and Ronald G. Stogdill, Trotwood, both of Ohio, assignors to Chemineer, Inc., Dayton, Ohio

Filed Sep. 13, 1976, Ser. No. 722,809

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—41 **6 Claims**



1. A fully cartridge, corrosion-resistant seal and agitator shaft assembly for use on mixer tanks particularly adapted for effecting sealing between an agitator shaft and the wall defining the opening through which the shaft extends into the mixer tank, said seal and shaft being free of any metal surface exposed to the contents of the tank, comprising:

a. a stationary, vertically elongated annular seal housing mounted on the tank defining an opening which opens into the tank,

b. an agitator shaft extending through said housing into said tank,

c. bearing means supporting said shaft for rotation within said housing,

d. a sleeve within said housing mounted at a predetermined axial position on the agitator shaft and fixed thereto for direct rotation therewith,

e. upper and lower annular seal rings secured in stationary relation in said housing,

f. a seal retainer secured to said sleeve for direct rotation therewith and enclosed within said housing between said stationary seal rings

g. upper and lower rotary seal assemblies carried by said retainer for direct rotation therewith and each including a rotary annular seal member having a non-metallic surface positioned for running sealing engagement with the adjacent said stationary seal ring,

h. said sleeve proportioned to terminate at the lower end thereof at a position axially intermediate said seal assemblies within said housing,

i. the upper said seal member having an inside surface adapted to form a fluid seal with the outer surface of said sleeve,

j. said shaft having a corrosion resistant coating thereon extending from a position axially above said lower seal assembly into said tank, and

k. said non-metallic surface of said annular seal member of said lower seal assembly being proportioned to form a fluid seal directly against said shaft on the coated surface thereof to prevent access of the contents of the tank to said sleeve.

4,094,514

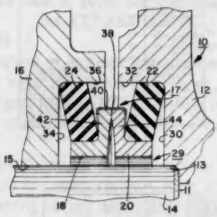
METAL ALLOY COMPOSITION WITH IMPROVED WEAR RESISTANCE

Donald L. Johnson, Rolling Meadows, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Filed Nov. 28, 1977, Ser. No. 855,216

Int. Cl.[2] C22C *38/18*; F16J *15/28, 15/32*

U.S. Cl. 277—92 **9 Claims**



1. A tough, wear resistant metal alloy composition comprising, in weight percent, from about 3.10% to about 3.35% carbon, not more than 1.00% manganese, from about 0.75% to about 1.40% silicon, from about 16.5% to about 19.0% chromium, from about 0.75% to about 2.00% vanadium, from about 2.5% to about 4.0% molybdenum, from about 0.25% to about 1.25% cobalt, from about 1.75% to about 3.00% tungsten, not more than 0.040% phosphorous, not more than 0.040% sulfur, and the remainder iron.

4,094,515

SEAL DEVICE IN A ROLLER CHAIN

Kumakichi Araya, No. 2, Daishoji Seki-machi, Kaga-shi, Ishikawa-ken, and Junichi Motoya, I-13, Diashoji Honmachi, Kaga-shi, Ishikawa-ken, both of Japan

Filed Feb. 8, 1977, Ser. No. 766,678

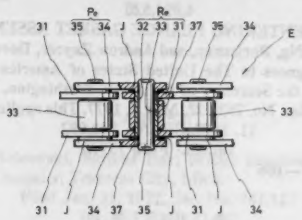
Claims priority, application Japan, Feb. 20, 1976, 51-18280; Feb. 20, 1976, 51-18281

Int. Cl.[2] F16J *15/34*; B62D *55/00*

U.S. Cl. 277—92 **3 Claims**

1. A seal device in a roller chain comprising an annular body rich in rubber-like elasticity having square lips in an outer peripheral edge portion of a base portion thereof and having one surface formed into a substantially X-letter cross section between said lips by a triangular concave portion and curved side walls, a pin link plate for holding and securing said annular body in opposed relation with a roller link plate, and a pin received into said pin link plate, said pin having ends caulked, characterized in that said lips are inwardly and outwardly pressed against said pin into slight contact with said roller link plate and said pin link plate, and as the chain travels, said lips

are further brought into intimate contact with said roller link plate and said pin link plate by means of deformation of the side



walls to prevent leakage of lubricating oil in the peripheral edge of the pin or to prevent entry of dirt.

4,094,516

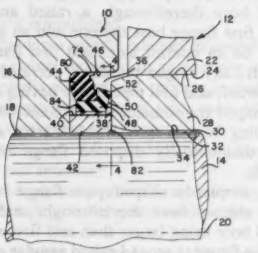
TRACK PIN ASSEMBLIES AND SEAL THEREFOR

James P. Morley, Arlington Heights, and William J. Woods, Bensenville, both of Ill., assignors to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Continuation-in-part of Ser. No. 694,265, Jun. 9, 1976, abandoned. This application May 10, 1977, Ser. No. 795,569

Int. Cl.[2] F16J *15/38, 15/54*

U.S. Cl. 277—92 **13 Claims**



1. An end face seal unit for use in severe service environments, said assembly comprising, in combination, a primary annular sealing ring having a generally axially extending flange portion and a generally radially extending flange portion, said axial flange having respective inner and outer diameter surfaces and said axial flange having generally radially extending front and rear surface portions, said front surface portion of said radial flange having a portion thereof adapted to engage a mating surface in snug end face sealing engagement therewith when urged axially toward said mating surface, and a secondary sealing member of generally annular form, said secondary member including generally axially extending inner and outer diameter surfaces and front and rear surface portions, said front and rear surfaces being inclined forwardly and inwardly such that said secondary member, in the unstressed condition thereof, has a generally parallelogram shaped cross section, said inner diameter of said secondary member being received in use over said outer diameter of said axial flange portion of said primary seal ring, with at least a portion of said front surface of said secondary seal member engaging at least a portion of said rear surface of said primary seal member, said primary member being made from a relatively stiff but resilient first elastomeric material, and said secondary member being made from a second resilient elastomeric material which is substantially less stiff than said first material, said axial flange portion of said primary member being adapted to be supported in use on the inner diameter thereof by a portion of an element being sealed thereby.

4,094,517

SEAL FOR A UNIVERSAL JOINT

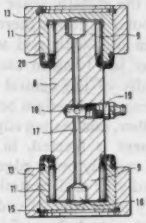
Erich Aucktor, Offenbach am Main, Germany, assignor to Lohr & Bromkamp GmbH, Offenbach am Main, Germany

Filed Dec. 16, 1976, Ser. No. 751,166

Claims priority, application Germany, Dec. 17, 1975, 2556769

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—94 **4 Claims**



1. In a sealing device for a universal joint, the combination of a trunnion pin having roller bearings adjacent thereto, a bearing element surrounding said trunnion pin and having an inner wall spaced from said pin, a resilient sealing ring rigidly mounted on said trunnion pin and having a first portion extending axially to project between said bearing element and said trunnion pin toward said roller bearings, said sealing ring having a second portion extending radially from said first portion and having an axially directed surface thereon engaging an end face portion of said bearing member, a sealing lip on said first portion extending substantially radially therefrom and having an outer edge movably engaging the inner wall of said bearing element, said first and second portions together with said bearing element defining a chamber, said lip defining an angle with said bearing element inner wall of less than 90° with respect to the interior of the bearing element such that the lubricant can flow outwardly from the interior of the bearing element.

4,094,518

SHAFT SEAL

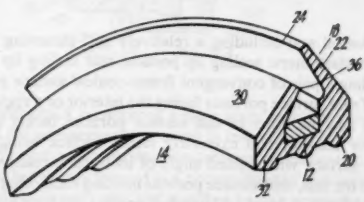
Jack Jebson Cox, Cheltenham, Australia, assignor to Flavell Proprietary Limited, Australia

Filed Aug. 23, 1976, Ser. No. 717,008

Claims priority, application Australia, Aug. 27, 1975, 2956/75; May 4, 1976, 5800/76

Int. Cl.[2] F16J *15/34*

U.S. Cl. 277—95 **7 Claims**



1. A fluid seal for installation as a unit between first and second, relatively rotatable machine elements, said seal unit including a relatively rigid, annular seal case element having a mounting portion for engaging one of said machine elements and a radially extending flange portion having an axially directed first sealing surface facing toward the region to be sealed and an axially directed second sealing surface facing axially away from the region to be sealed, and an annular elastomeric seal element molded into a single piece, said elasto-

meric element having a seal body including a radially inwardly directed portion adapted to engage the other of said machine elements to form a secondary seal therewith, and first and second, axially inner and outer sealing lip portions extending radially outwardly from the axial ends of said body, said lip portions being spaced apart from each other at the radially inner ends thereof by a radially outwardly facing, circumferentially extending seal body surface, said lips each including a sealing edge adjacent the radially outer portions thereof and having said radially outer portions thereof extending axially towards each other in use, with said sealing edges of said axially inner and outer lips lying in use respectively axially inwardly and outwardly of the central plane of said radial flange of said case element, said edges being also spaced radially apart from each other, said sealing edges being disposed, as said elastomeric element is formed, in axially overlapping relation such that said radially outer edge of said axially inner lip lies axially outwardly of said central plane of said radial flange and said radially outer edge of said axially outer lip lies axially inwardly of said central plane of said radial flange, said case element being positioned in use such that said radial flange thereof extends between said lips, such that said lip edges engage said first and second flange surfaces, respectively, in snug engagement, said lips being thereby biased towards each other and toward said first and second flange surfaces by the inherent resiliency of said lips, thereby furnishing an axially directed sealing force for application to said first and second sealing surfaces respectively.

4,094,519

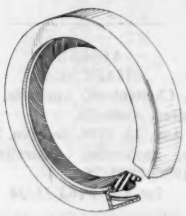
SHAFT SEAL WITH HELICAL PUMPING ELEMENT

William O. Heyn, and Glenn W. Peisker, both of Barrington, Ill., assignors to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Continuation of Ser. No. 225,862, Feb. 14, 1972, abandoned. This application Aug. 20, 1974, Ser. No. 499,070

Int. Cl.[2] B61F *15/22*

U.S. Cl. 277—134 **4 Claims**



1. An oil seal including a relatively stiff mounting portion and an elastomeric sealing lip portion, said sealing lip portion including a pair of convergent frusto-conical surface portions, one of said surface portions facing the interior or a region to be sealed and the other of said surface portions facing a region exterior thereto, said exteriorly facing surface being only a single surface with a fixed angle of inclination relative to the axis of the seal, said surface portons meeting each other to form an annular seal band of intended contact with an associated shaft and a plurality of pumping elements lying on said exteriorly facing surface, each of said elements being partially defined by a pair of side faces meeting to define a working edge portion which is straight throughout its entire extent, each of said elements being of continuously varying height throughout its entire extent and having substantially no height near said seal band, said working edge extending between two points which are radially and axially offset with respect to each other, said points being also spaced apart from each other by an angle measured paralled to the plane of said seal band, and with one of said points lying substantially on said seal band, whereby said working edge blends gradually into said frusto-conical surface portion.

4,094,520

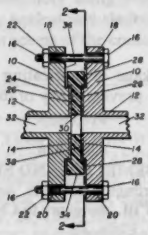
SELF CENTERING FLANGE GASKET ASSEMBLY

Wahling H. Ng, Rockaway, and Andrew Zaycer, Dover, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 793,023, May 2, 1977. This application Oct. 11, 1977, Ser. No. 841,092

Int. Cl.[2] F16J *15/10*

U.S. Cl. 277—166 **3 Claims**



1. A self centering flange gasket assembly for use in making connections to pipelines of unequal size carrying molten explosive materials therein which comprises:

a first circularly shaped pipe flange having a first axially aligned bore therethrough, a raised annular circularly shaped first flange boss thereon and an annular shoulder section on an interior side, said first flange boss having concentrically ringed circularly serrated grooves in the face thereof, said first pipe flange having an integral tubularly shaped transmission line connection section axially protruding from an exterior side thereof, and a first plurality of diametrically disposed flange bolt holes therethrough;

a second circularly shaped pipe flange having a second axially aligned bore therethrough, said second axially aligned bore being larger than said first axial bore of said first pipe flange, a second raised annular circularly shaped flange boss thereon and an annular second shoulder section on an interior side, said second flange boss having concentrically ringed circularly serrated grooves in a face thereof, said second pipe flange having a second integral tubularly shaped transmission line connection section axially protruding from an exterior side thereof, and a second plurality of diametrically disposed flange bolt holes therethrough said second flange bolt holes being in axial alignment with said first flange bolt holes;

a circular rim shaped venturi gasket having an axially aligned tubular protrusion section extending perpendicularly from a first face thereof, said protrusion section having an internally curved venturi section on one end which communicates with an axial cylindrical bore on the other end, an annular counterbore surface disposed on the other face of said gasket adjacent said serrated grooves of said flange boss of said first pipe flange, a second gasket annular counterbore sealing surface disposed on said first face of said venturi gasket, said second gasket sealing surface being disposed adjacent to and in sealing contact with said serrated grooves of said second flange boss, said tubular protrusion section slidably tightly fitting within said second axially aligned bore of said second pipe flange, and a gasket locating rim operatively disposed intermediate said shoulder sections of said first and second pipe flanges; and

threaded bolt means operatively disposed in said pair of first and second flange bolt holes, for holding said rim shaped venturi gasket intermediate said first and second pipe flanges, the rim of said gasket nesting intermediate said

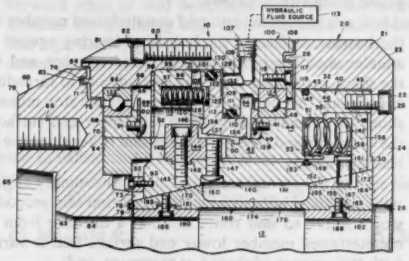
first and second flange shoulder sections, said annular grooves of said gasket being located in sealing contact with said serrated grooves of said first and second flange bosses.

4,094,521

COLLET CHUCK

Charles Piotrowski, Suttons Bay, Mich., assignor to Sheffer Collet Company, Traverse City, Mich.

Filed Jan. 21, 1977, Ser. No. 761,127
Int. Cl.[2] B23B *31/20*
U.S. Cl. 279—4 23 Claims



1. A collet chuck comprising:

a chuck body having a spindle adapter mounted to one end and a collet retainer mounted to an opposite end; each of said body, spindle adapter and retainer including an axially extending aperture aligned with each other for the passage of a workpiece therethrough;

a slip ring assembly rotatably mounted to said body between said adapter and retainer;

an axially movable piston mounted to said slip ring assembly;

a workpiece clamping collet positioned within said body; and

actuator means slidably mounted to said body and engaging said collet and biasing it into clamping position; said piston when actuated engaging said actuator means and shifting it axially to release said collet.

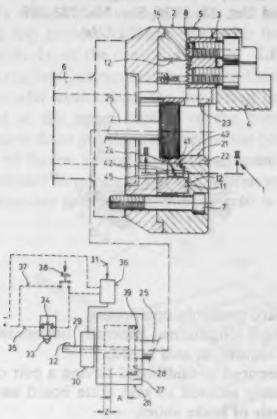
4,094,522

CHUCK HAVING RADIALLY RECIPROCATING JAWS

Karl Hiestand, Pfullendorf, Germany, assignor to Firma SMW-Spanneinrichtungen Schneider & Weisshaupt, Germany

Filed Dec. 13, 1976, Ser. No. 749,694
Claims priority, application Germany, Dec. 13, 1975, 2556227
Int. Cl.[2] B23B *31/16*
U.S. Cl. 279—4 28 Claims

1. In a chuck, for turning machines, of the type including a chuck body, and radially displaceable jaws each movable by a key bar, guided in the chuck body tangential to the axis of turning, with each key bar having a splined strip meshing with teeth on the associated jaw and being displaceable to an extent such that, for removing the associated jaw, the splined strip attains a position in which it is disengaged from the teeth of the associated jaw, an improved key bar actuating mechanism comprising, in combination, a control member concentrically guided in said chuck body and axially displaceable in the latter through a key bar operating range and into end positions beyond said operating range; and mechanical means interconnecting said control member and said key bars, operable, responsive solely to axial displacement of said control member in said chuck body, to displace said key bars tangentially of the



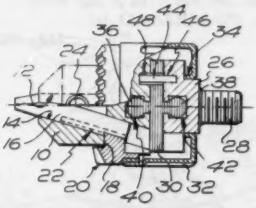
axis of turning to displace said jaws radially of said chuck body, and restraining rotation of said control member.

4,094,523

DRILL CHUCKS

George Cecil Derbyshire, Sheffield, England, assignor to The Jacobs Manufacturing Company, Limited, Sheffield, England

Filed Nov. 18, 1976, Ser. No. 742,867
Claims priority, application United Kingdom, Nov. 24, 1975, 48247/75
Int. Cl.[2] B23B *31/04*
U.S. Cl. 279—62 9 Claims



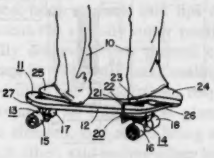
1. A drill chuck comprising a main body part; jaws slidably mounted for converging movement in respective guides in said main body part; a nut member rotatably mounted on said main body part but axially located in a circumferential groove encircling said body part, said nut member having screwthreaded engagement with said jaw members; said nut member including a bevel gear element with which an extraneous chuck key may be engaged for adjusting the jaws; a further body part which provides a mounting means for connecting the chuck to a power tool driving spindle; a cylindrical sleeve which is connected at one end to said nut member and at its other end surrounds a portion of said further body part; and means located between the main body part and the further body part for retaining them in position with an initial degree of co-axial alignment whilst allowing a self-centering action when drilling.

4,094,524

SKATE BOARD BRAKING AND STEERING SYSTEM

Mathew Ralph Carroll, 3516 Downing, Glendale, Calif. 91208

Filed Oct. 18, 1976, Ser. No. 733,389
Int. Cl.[2] A63C 17/14
U.S. Cl. 280—11.2 14 Claims



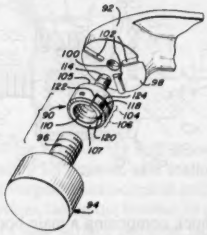
1. A skate board assembly comprising:
a board having a longitudinal generally horizontal axis;
a front truck secured to said board;
a rear truck secured to said board having a pair of wheels;
a brake assembly secured to said skate board assembly including a pair of brake shoes;
actuator means for pivoting said brake shoes about a first axis substantially transverse to said longitudinal axis of said board and selective into engagement with said wheels by the application of force to said actuator means;
means mounting said actuator means for rotational movement about a second axis at an inclined angle with respect to the said longitudinal axis of the board whereby said actuator means may pivot said brake shoes into simultaneous engagement with both wheels of said rear truck by pivoting about said transverse axis or into engagement with one of said wheels by rotation of said actuator means about said second axis of rotation.

4,094,525

ROLLER SKATE TOE STOP CONVERTER

Cecil E. Davis, Tulsa, Okla., assignor to Unarco Industries, Inc., Chicago, Ill.

Filed May 2, 1977, Ser. No. 792,698
Int. Cl.[2] A63C 17/14
U.S. Cl. 280—11.2 5 Claims



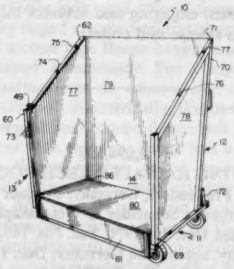
1. An adjustable toe stop converter for converting a roller skate from use with a first toe stop having a threaded mounting stud of a given diameter and thread to use with a second toe stop having a threaded mounting stud of a diameter larger than the mounting stud of said first toe stop, said skate having on its forward end a toe stop mounting shoulder presenting a generally downwardly and forwardly facing toe stop bearing surface and defining a first threaded bore of a diameter and thread equal to that of the threaded mounting stud of said first toe stop, said toe stop converter comprising:
(a) a counterbored member having at one end wall an upper end surface adapted to matingly abut said roller skate toe stop bearing surface and having at the opposite end wall a lower end surface, said one end wall defining a second bore having a second diameter at least equal to the diameter of said first bore in said roller skate toe stop mounting shoulder and less than the diameter of the mounting stud of said second toe stop, said opposite end wall defining a third threaded bore having a diameter and thread equal to that of the mounting stud of said second toe stop, said third bore being coaxial and communicating with said second bore to define an annular shoulder between said second and third bores;
(b) a bolt having a head of a diameter greater than that of said second bore and having a shank with a diameter less than that of said second bore, said shank having threading means adapted to threadingly engage said first bore in said roller skate toe stop mounting shoulder; and
(c) means for securing the threaded mounting stud of said second toe stop against rotation within said third bore when said stud of the second toe stop is threadingly engaged therewith, whereby
said bolt can be inserted into said counterbored member with the bearing surface of the bolt head bearing against said annular shoulder in the counterbored member and with the shank projecting from said second bore to threadingly engage said first bore in said roller skate toe stop mounting shoulder for matingly abutting said upper end surface of the counterbored member against said roller skate toe stop bearing surface,
said stud of the second toe stop can be threadingly engaged with said third bore to adjustably position said second toe stop relative to said roller skate at a distance from said counterbored member lower end surface that is variable with the amount of thread engagement, and
said stud of the second toe stop can be secured in the desired position by said securing means.

4,094,526

PORTABLE DISPLAY VEHICLE

Richard Allen Clarke, Greenwich; William James Chvala, and Raymond Edward DeWitte, both of Danbury, all of Conn., assignors to PepsiCo, Inc., Purchase, N.Y.

Continuation of Ser. No. 491,070, Jul. 23, 1974, abandoned. This application Jun. 11, 1976, Ser. No. 694,987
Int. Cl.[2] B62B 3/02
U.S. Cl. 280—47.35 12 Claims



1. A portable display vehicle for transporting, storing and displaying food, beverage and other displayable products comprising:
a base member having a rear edge, said base member including a plurality of casters attached to the underside of said base member for supporting the vehicle in an upright and stable condition,
sidewalls attached in a vertical position to the sides of said base member,
an L-shaped product support member comprising a back wall attached to a bottom shalf wherein said support member is attached to said base member between said sidewalls so that said bottom shelf slopes downwardly

toward the rear edge of said base member and wherein said sidewalls and said product support member form an open volume for containing the displayed products, said sidewalls each being bounded by rigid frame members with a continuous skin member rigidly supported between said frame members and each having an upper frame slanting downward from the top of said back wall and away from said rear edge,

a substantially vertically oriented front panel extending downwardly from the front edge of said bottom shelf to a position below said base member so as to shield at least a portion of said casters from view, and

a lower extension shelf for extending the surface formed by said bottom shelf,

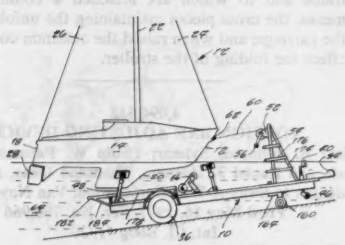
said lower extension shelf comprising a horizontal shelf member extending from the front edge of said bottom shelf, a vertically oriented sign display panel for displaying written material extending downwardly from the forward edge of said horizontal shelf member, a hinge member for attaching said horizontal shelf member and said sign display panel, and a plurality of supporting legs extending downwardly from said sign display panel.

4,094,527

BOAT TRAILER

Richard L. Miller, 3612 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Dec. 20, 1976, Ser. No. 752,675
Int. Cl.[2] B60P 3/10
U.S. Cl. 280—414 R **23 Claims**



1. A trailer for storing thereon a boat having a hull and keel, and facilitating launching and landing of the boat, and comprising:

a flatbed having a longitudinal center axis;

wheels connected to the flatbed for moving the trailer into and out of cooperative relationship with the boat;

support means connected to the flatbed and positioned to engage the hull of the boat on opposite sides thereof, to thereby retain the boat in position on the trailer, and

pivoted rolling means positioned on the flatbed intermediate said support means for rotatingly engaging the hull to accommodate entry and exit of the boat from the trailer, and for supporting the keel during retention of the boat on the trailer, and positioning means for angularly positioning said pivoted rolling means with respect to said flatbed and facing rearward of said flatbed.

4,094,528

SKI STRUCTURE

John Michael Cluzel, 753 Hickory Hill Rd., Wyckoff, N.J. 07481

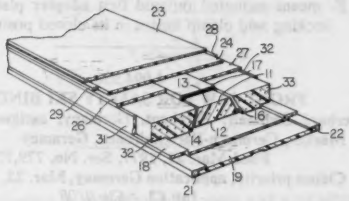
Filed Oct. 21, 1976, Ser. No. 734,607
Int. Cl.[2] A63C 5/00
U.S. Cl. 280—610 **6 Claims**

1. A ski structure comprising:

a central member of solid foamed material free of mechanical directivity and extending longitudinally along the structure and having a trapezoidal cross-section defined by a base, a top narrower than the base and substantially parallel to the base, and two sides joining the edges of the base to the corresponding edges of the top;

a trapezoidal torsion box of fiber-reinforced plastic fitting snugly around the central member and comprising a base and a top corresponding in width to the base and top, respectively, of the central member;

a solid, resilient bottom member wider than the base of the trapezoidal torsion box, the box being firmly adherently joined to the upper surface of the bottom member to remain in fixed position relative the the bottom member in spite of forces having lateral components acting on the trapezoidal torsion box and the bottom member, the bottom member being much wider than it is thick;



a solid, resilient top member wider than it is thick over at least most of its length, and rigidly, adherently joined to the top of the trapezoidal torsion box to remain in fixed position relative to the top member in spite of said forces acting to move the top member relative to the trapezoidal torsion box, the top member being wider than the top of the trapezoidal torsion box;

a pair of solid, resilient side members joining edge sections of the top member to corresponding edge sections of the bottom member to form an outer boxlike structure; and

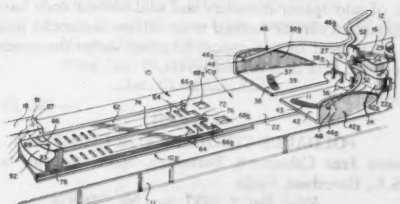
solid, foamed material free of mechanical directivity at least substantially filling the spaces on each side of the trapezoidal torsion box and within the outer boxlike structure.

4,094,529

SKI BINDING ADAPTER

Harold H. Nasson, 8 Hidden Ledge Rd., Manchester, Mass. 01944

Filed Apr. 7, 1977, Ser. No. 785,519
Int. Cl.[2] A63C 9/086
U.S. Cl. 280—614 **12 Claims**



1. An adapter for use in conjunction with a standard downhill ski having a standard downhill ski binding including toe and heel clamps secured thereto, said adapter being removably retainable in the standard downhill ski binding and being adapted to clamp a cross-country ski boot so as to enable the standard downhill ski to be used for cross-country skiing, said adapter comprising

A. first and second elongated relatively thin adapter plate sections adapted to be supported on the downhill ski between the toe and heel clamps of the standard downhill binding, said plate sections being adjustable lengthwise relative to one another,

B. means for securing said plate sections in different selected positions of lengthwise adjustment,

C. means projecting upwardly from the forward end of said first plate section adapted to be clamped to the downhill ski by the toe clamp of the standard downhill binding,

D. means projecting upwardly from the rear end of said second plate section adapted to be clamped to the downhill ski by the heel clamp of the standard downhill binding,

E. clamp means mounted on said first adapter plate section, said clamp means being movable from an open position wherein it permits the cross-country ski boot to be positioned on said first adapter plate section to a closed position wherein it clamps the toe of the cross-country ski boot to said first adapter plate section, and

F. means mounted on said first adapter plate section for locking said clamp means in its closed position.

4,094,530

FRONT JAW FOR SAFETY SKI BINDINGS

Gerhard Sedlmair, Farchant, Germany, assignor to Hannes Marker, Germisch-Partenkirchen, Germany

Filed Mar. 21, 1977, Ser. No. 779,773
Claims priority, application Germany, Mar. 22, 1976, 2612069
Int. Cl. A63c *9/08*
U.S. Cl. 280—625 **7 Claims**

1. A front jaw for a safety ski binding, comprising a jaw portion adapted to be fixed with respect to a ski and having two vertical shafts, a central abutment attached to the jaw portion, two levers pivotable about the vertical shafts, first ends of the levers serving as retainers for a sole of a ski boot to restrain outward and upward movement thereof, a vertical screw which is rotatably mounted in the jaw portion for engaging the tapped hole, the screw being prevented from axial displacement, the spacer member being vertically displaceable upon rotation of the screw, spring means for urging second ends of said levers into engagement with said spacer member, one of said spacer members and said second ends having an engagement surface formed as an oblique surface so that vertical movement of said spacer member varies the spacing between the first ends of said levers.

4,094,531

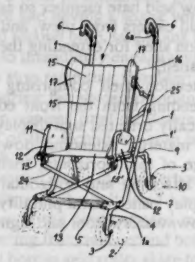
FOLDABLE STROLLER FOR CHILDREN

Ramon Jane Cabagnero, Barcelona, Spain, assignor to Jane, S.A., Barcelona, Spain

Filed Jan. 5, 1977, Ser. No. 756,974
Claims priority, application Spain, Jan. 14, 1976, 218.173
Int. Cl.² **B62B** *7/02*
U.S. Cl. 280—649 **7 Claims**

1. A foldable stroller comprising:

a seat and seat back, said seat back being formed by a flexible laminar assembly reinforced lengthwise by juxtaposed strips which provide rigidity and which permit transverse folding in zigzag form; a frame for said back, said back being mounted in said frame, said frame having side-pieces; articulated front and rear scissor-type wheel carrying elements, said frame side-pieces being articulated in a lower portion thereof to the articulation between the scissor-type wheel carrying elements; a harness formed by a pair of branches which are an extension of said front wheel carrying elements, said frame side-pieces being connected with the respective branches of the harness by respective articulated divider-type elements, said divider-type element arranged for opening and closing for determining respective different positions of inclinations of the back, said rear wheel-carrying element being situated between the side-piece of the frame and the front wheel-carrying element which is in external location; a first set of two articulatedly crossed rods for connecting said front



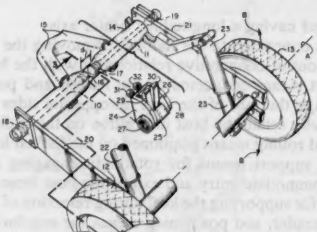
wheel-carrying elements in a front lower portion thereof with a front upper portion of the rear wheel-carrying element, a second set of two articulatedly crossed rods for connecting said front and rear wheel-carrying elements in a rear portion; and two cross-pieces split into two articulated sections which connect with the side-pieces of the frame and to which are attached a common control means, the cross pieces maintaining the unfolded state of the carriage; and when raised the common control means effect the folding of the stroller.

4,094,532

TORSION BAR ADJUSTING DEVICE

William A. Johnson, Sylmar; Philip W. Pausmer, Newbury Park, and Russel J. Harmon, Thousand Oaks, all of Calif., assignors to Sway-A-Way Corporation, Van Nuys, Calif.

Filed May 16, 1977, Ser. No. 796,966
Int. Cl. B60g *11/20*
U.S. Cl. 280—695 **3 Claims**



1. A torsion bar adjusting device for insertion in the rear torsion bar suspension system of a car wherein said system includes two axially aligned independent torsion bars extending in directions generally parallel to the rear wheel axes ahead of the rear wheels within a torsion bar housing tube fixed to the frame of the car with the inner ends of the torsion bar secured to the housing tube and their oppositely extending outer ends secured to rear wheel supporting spring plates respectively, so that up and down movement of each rear wheel is opposed by a twisting reaction torque from its associated torsion bar, said device comprising, in combination:

(a) a frame structure including a collar having an elongated slot parallel to its axis in its side wall;

(b) first and second axially aligned torsion bar end receiving sockets rotatable within said collar and having integral radially outwardly extending arms passing through said slot; and

(c) First and second arm engaging means on said frame each being individually adjustable to move an associated arm relative to said frame and thereby impart a rotation to the integral socket portion from which the arm extends within said collar through a number of degrees within the width of said slot

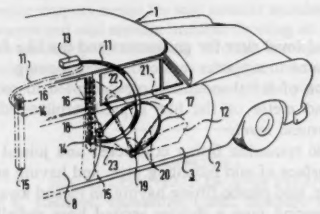
whereby a short center section of said housing tube in the suspension system of said car can be cut out and the collar of said device secured to the housing tube in place of said section with the inner ends of said torsion bars being received in opposite ends of said collar and respectively secured in said first and second torsion bar end receiving sockets, operation of said arm engaging means imparting a twisting force into the torsion bars to thereby enable adjustment of the spring force provided by said torsion bar suspension system to each of the rear wheels of the car respectively.

4,094,533

SEATBELT SYSTEM FOR MOTOR CARS

Alfred Grossbach, Lindenstrasse 42, Tamm, Wttbg, Germany

Division of Ser. No. 596,293, Jul. 16, 1975, Pat. No. 4,047,737.
This application Feb. 4, 1977, Ser. No. 765,759
Claims priority, application Germany, Jul. 19, 1974, 2434748; Jul. 4, 1975, 2529811
Int. Cl.² B60R *21/02*
U.S. Cl. 280—745 **6 Claims**



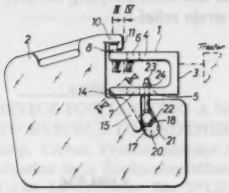
1. A seat belt system particularly for motor vehicles having doors which open and close by movement thereof forwardly and rearwardly of said vehicle, said vehicle including a vehicle body having a side wall, said vehicle body having a front, a back and a center spaced between said front and back, at least one sliding door mounted on said side wall of said vehicle body and movable from a closed position flush with the side wall of said vehicle body to an intermediate position parallel with and spaced from the closed position and then to an open position spaced in the longitudinal direction of the vehicle from the intermediate position, and means for mounting said door to said vehicle including a first pivotal arm pivotally mounting said door to said vehicle body, each of said at least one sliding doors having an inner side with the inner side having a front end and a rear end, said seat belt system comprising at least one safety belt having a first end and a second end, means mounting said first end to said center of said vehicle, means mounting said second end with said at least one safety belt extending freely in an unrestrained condition continuously from said first end to said second end, said means mounting said second end of said at least one safety belt including a second pivotal arm having said second end of said safety belt attached thereto and operatively associated with said first pivotal arm, said second pivotal arm operating to effect pivotal movement in response to pivotal movement of said first pivotal arm to move said second end of said at least one belt relative to said door to a first belt position to dispose said safety belt in an orientation permitting ingress and egress of a passenger into and out of said vehicle when said door is in said open position, and to a second belt position to dispose said belt to actively restrain a passenger in said vehicle when said door is moved to said closed position.

4,094,534

DETACHABLE BALLAST VEHICLE STABILIZER

Helmut Welke, and Karl Tullius, both of Cologne, Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Dec. 6, 1976, Ser. No. 747,437
Claims priority, application Germany, Dec. 4, 1975, 2554581
Int. Cl.² B60B *39/00*; B60R *19/04, 27/00*; B61C *15/04*
U.S. Cl. 280—760 **8 Claims**



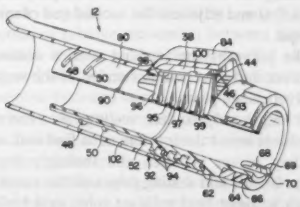
1. In combination, a ballast weight means and agricultural motor vehicle: a holding device having said ballast weight means detachably suspended thereon and releasably connected to said motor vehicle, locking shaft means extending transverse to and through said ballast weight means and being adjustable selectively in the direction toward and away from said holding device, and means operatively connected to said locking shaft means as well as operable in response to said locking shaft means being adjusted toward said holding device thereby to fix and lock said ballast weight means and said holding device to releasable secure the same to each other to avoid undesired vibration and noise during operative use of said ballast weight means with the vehicle, said means operatively connected to said locking shaft means including clamping elements respectively connecting the ends of said locking shaft means to said holding device, said holding device for each ballast weight means comprising at least two supporting bearings spaced from each other for respective engagement with said ballast weight means, and said clamping elements through the intervention of said locking shaft acting upon said clamping elements to exert a moment upon all of said supporting bearings.

4,094,535

CONDUCTIVE HOSE AND ENDS

Keith G. Minton, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Jan. 10, 1977, Ser. No. 758,044
Int. Cl.² A47L *9/24*
U.S. Cl. 285—7 **4 Claims**



1. An electrically conductive hose including at least one plastic coupling assembly, the combination including;

(a) an inner plastic coupling member having a means for attachment of a hose. '(b) a hose in telescopic relationship with said inner, plastic coupling member,

(c) an outer plastic coupling member received over said

inner coupling member and including an internal periphery,

(d) means forming annular ridges on said inner coupling member, said ridges being spaced from each other by reliefs disposed between said ridges, said ridges having at least portions with substantially equal radial extent,

(e) terminations on said portions of said ridges being in generally tight abutting contact with portions of said internal periphery of said outer member, said portions having a generally constant annular extent,

(f) adhesive means disposed between said terminations,

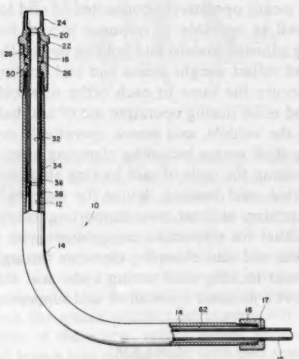
(g) said means forming annular ridges formed on an enlarged portion on said inner coupling member of sufficient size to mount a strain relief.

4,094,536

METER RISER

Judson C. Cole, Tulsa, and Eldon W. Morain, Broken Arrow, both of Okla., assignors to Continental Industries, Inc., Tulsa, Okla.

Filed Dec. 20, 1976, Ser. No. 752,438
Int. Cl.² F16L *13/02*
U.S. Cl. 285—21 **6 Claims**



1. A meter rising comprising:

(a) a length of small diameter polyethylene pipe adapted for attachment at one end to a line pipe carrying a fluid under pressure;

(b) a selected length of high ambient heat tolerant tube of substantially the same diameter as said polyethylene pipe having a first end adjacent the second end of said polyethylene pipe.

(c) cup-like polyethylene bushing with a central opening placed over and attached and sealed at the second end of said polyethylene pipe;

(d) a short length polyethylene sealing tube received on said high ambient heat tolerant tube at its first end, and including sealing means between and sealingly engaging the inside surface of said sealing tube and the outer surface of said high ambient heat tolerant tube, said bushing being heat sealed to said sealing tube in coaxial relationship; and

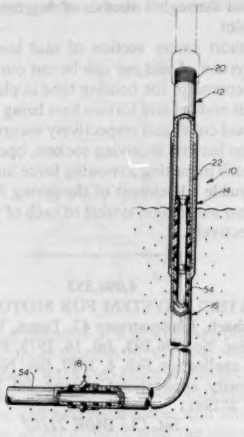
(e) a meter riser body surrounding said high ambient heat tolerant tube and a portion of said polyethylene pipe comprising a selected length of metal pipe surrounding said joined pipe and tube and including means to seal said riser body to said high ambient heat tolerant tube and means to attach said riser body to a meter or the like.

4,094,537

GROUND LEVEL METER RISER

Robert W. Lyall, 9770 El Greco Cir., Fountain Valley, Calif. 92708

Filed Sep. 1, 1976, Ser. No. 719,613
Int. Cl.² F16L *11/12, 33/00*
U.S. Cl. 285—47 **8 Claims**



1. A ground level riser for gas meters and the like for connecting the same to a plastic service line, comprising:

(a) a section of metal mounting pipe adapted to receive a valve and meter or the like a predetermined distance above ground level,

(b) a plastic transition fitting connected and joined to the inside surface of said mounting pipe, and having an inner first bore, said plastic fitting having on its end away from said mounting pipe a shorter second bore radially outwardly offset from said first bore,

(c) a predetermined length of a plastic product carrying tube received in and joined to said second bore so that said first bore is generally co-dimensional in diameter with the inside diameter of said tube,

(d) a relatively thin wall lower steel protective casing externally of said tube having an upper end and a lower end and abutting said plastic fitting at its upper end and extending over a predetermined length of said length of tube, said first protective casing being bent if desired to give a specified amount of horizontal and vertical run in said riser, said lower protective casing being generally coaxial with said mounting pipe and plastic transition fitting and further being generally of the same external diameter as said mounting pipe and as at least a portion of said plastic transition fitting,

(e) a seal means at the lower end of said lower protective casing for sealing the space inside of said lower casing and outside said tube from water and other containment fluids and materials,

(f) an upper protective steel casing secured to and extending from below ground level and below the upper end of said lower protective casing to said mounting pipe above said transition fitting, said upper casing being generally of larger diameter than either said lower casing or said mounting pipe and secured as by welding to both, and

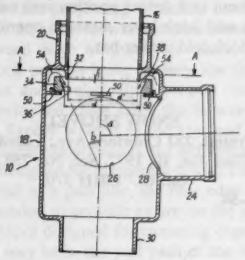
(g) a protective coating of plastic extending over said riser from said seal means to above that end of said upper casing which is secured to said mounting pipe.

4,094,538

CONNECTION FOR EVACUATION PIPES

Georges Pichon, 14, Allee de Port Royal, Residence de l'Abbaye, 91 Gif Yvette, France

Filed Jul. 16, 1976, Ser. No. 705,880
Claims priority, application France, Jun. 25, 1976, 76 19356
Int. Cl.[2] F16L *41/00*
U.S. Cl. 285—150 4 Claims



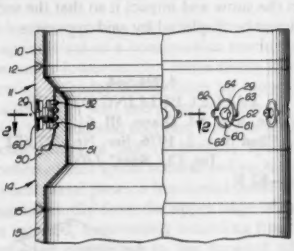
1. A hollow bodied joint for connection of at least one secondary pipe to a principal pipe comprising:
- a first union for fluidly connecting the outlet of the principal pipe to said joint
- at least one other union for fluidly connecting at least one secondary pipe to said joint
- an annular member having a downwardly inwardly tapering internal surface spacedly positioned below and coaxial to said first union
- annular support means for said annular member, said support means and said annular member forming an air channel for downwardly directing air through the space formed by said annular member and said pipe union to propel the liquid therein toward the center of the pipe and an outlet for fluid flow.

4,094,539

RIGID CONNECTOR AND PILING

Larry E. Reimert, Camarillo, Calif., assignor to Vetco, Inc., Ventura, Calif.

Continuation of Ser. No. 712,491, Aug. 9, 1976, abandoned. This application Nov. 23, 1977, Ser. No. 854,356
Int. Cl.[2] F16L *21/00*
U.S. Cl. 285—309 3 Claims



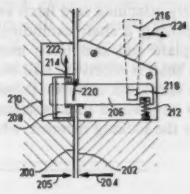
1. A rigid pipe connector comprising a metallic tubular pin having an external transverse shoulder and a plurality of axially spaced outer peripheral grooves, sides of said groove providing a plurality of axially spaced tapered surfaces, a metallic tubular box telescopically disposed over said pin and having a transverse end engaging said shoulder, circumferentially spaced lock members slidable radially in said box into said grooves, said lock members having tapered surfaces axially spaced from each other and simultaneously engaging said axially spaced tapered groove surfaces, means for shifting said lock members radially inwardly of said grooves to force the tapered surfaces of said lock members against said pin tapered surfaces and shift said pin axially of said box to force said shoulder against said box end and apply compressive preload to said box end and pin shoulder, the other sides of said groove axially spaced from said lock members to enable said compressive preload to be effected, the periphery of said pin within said box and the inner surface of said box confronting said periphery being shaped in such manner as to be free from axial force transmitting relation to each other so that the full preloading force produced by coengagement between said lock member tapered surfaces and pin tapered surfaces is transmitted to said pin shoulder and transverse box end contacting such shoulder.

4,094,540

CLOSURE DEVICE FOR LOCKING A MOVABLE ELEMENT WITH RESPECT TO ANOTHER ELEMENT

Joseph Antoine Roig, Yerres, France, assignor to Agence Nationale de Valorisation de la Recherche, Michelis, France

Filed Apr. 24, 1975, Ser. No. 571,322
Claims priority, application France, Apr. 24, 1974, 74 14138; Feb. 11, 1975, 75 04195
Int. Cl.[2] E05C *3/10*
U.S. Cl. 292—214 26 Claims

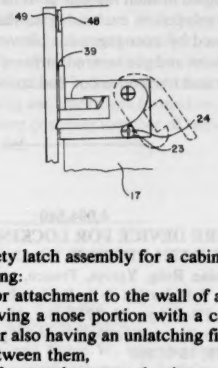


1. A closure comprising:
- (a) two elements relatively movable toward and away from each other, and means for separably locking said elements together, said locking means comprising:
- (b) a male member in the form of a flat plate mounted on and protruding from one of said elements, the plane containing said plate being in the direction of relative movement between said elements,
- (c) a casing carried by the other of said elements, said casing having an opening through which said plate can move freely into and out of said casing when the two elements are brought together and separated, said opening extending continuously along two adjacent sides of said casing,
- (d) a female member within said casing, said female member being a flat plate movable about an axis perpendicular to the direction of relative movement between said elements between a position substantially perpendicular to the direction of relative movement between the elements and a position oblique to that direction, said plate having an elongated slot perpendicular to the direction of relative movement between said elements, said slot being aligned with said casing opening and slightly wider than the thickness of said male member plate, and said slot extending to one edge of said plate, and
- (e) resilient means urging said female member plate toward its oblique position, said male member plate moving said female member plate toward its perpendicular position against the force of said resilient means when said elements are moved together to insert said male member plate through said casing opening and said slot in said female member plate, said male member plate becoming wedged within said slot upon attempted separation of said elements.

4,094,541
CONCEALED SAFETY LATCH ASSEMBLY

Larry Lee Simms, P.O. Box 1083, San Pedro, Calif. 94433

Filed Mar. 9, 1977, Ser. No. 775,740
Int. Cl.[2] E05C 3/04
U.S. Cl. 292—231 8 Claims

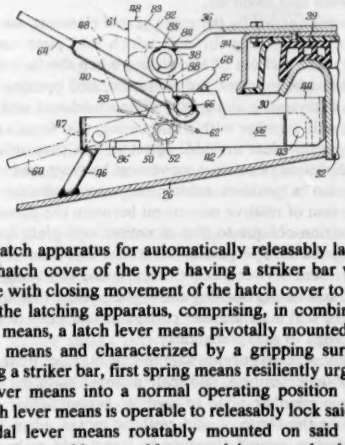


1. A concealed safety latch assembly for a cabinet having a hinged door comprising:
a mounting plate for attachment to the wall of a cabinet,
a latch member having a nose portion with a cam surface, said latch member also having an unlatching finger with a notch formed between them,
a locking member for attachment to the door of a cabinet, said locking member having means for engaging said latch member, and
means pivotally attaching said latch means to said mounting plate comprising a shaft extending outwardly from the mounting plate and said latch member has a bore into which said shaft is received, said bore being eccentrically located on said latch member thereby allowing the latch member to be pivoted to a position where it will not be engaged by the locking member when the cabinet door is closed.

4,094,542
DETENTABLE AUTOMATIC HATCH LATCH APPARATUS

Allen D. Siblik, Mundelein, Ill., assignor to MacLean-Fogg Lock Nut Co., Mundelein, Ill.

Filed Oct. 6, 1975, Ser. No. 619,857
Int. Cl.[2] E05C 3/30; B63B 19/14
U.S. Cl. 292—256.5 5 Claims

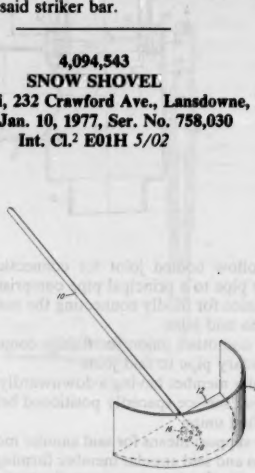


1. A latch apparatus for automatically releasably latching a hinged hatch cover of the type having a striker bar which is operable with closing movement of the hatch cover to forcibly engage the latching apparatus, comprising, in combination: a housing means, a latch lever means pivotally mounted on said housing means and characterized by a gripping surface for engaging a striker bar, first spring means resiliently urging said latch lever means into a normal operating position whereat said latch lever means is operable to releasably lock said striker bar, pedal lever means rotatably mounted on said housing means and operably movable to and between latching and detent positions, first cam means on said pedal means, second cam means on said housing means, second spring means operable to resiliently bias said first cam means against said second cam means whereby the same cooperate to secure said pedal lever means selectively in one of said latching and detent positions as selected, and repositioning means carried by and actuated with said pedal lever means for engaging said latch lever means, said repositioning means being operable in response to movement of said pedal lever means to said detent position to hold said latch lever means out of engagement with said striker bar, said repositioning means further being operable when forcibly struck by said striker bar to move said pedal lever means from said detent position into said latching position, whereby said latch lever means is operably repositioned to releasably lock said striker bar.

4,094,543
SNOW SHOVEL

Sabatino A. Fratini, 232 Crawford Ave., Lansdowne, Pa. 19050

Filed Jan. 10, 1977, Ser. No. 758,030
Int. Cl.[2] E01H 5/02
U.S. Cl. 294—54 2 Claims

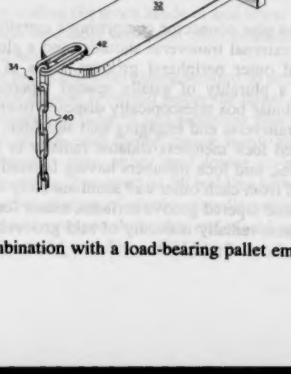


1. An apparatus for snow displacement which comprises:
a semi-circular flat base plate;
a curved panel having a lower edge and straight diametric edge, said panel being substantially at a right angle with respect to said base, rigidly connected to the curved portion of said base plate such that the plane of the base is at a small angle with respect to the ground, and said lower edge and said straight diametric edge being in contact with the ground when said apparatus is in use; and
a handle pivotally connected to said base plate which permits an operator to push said apparatus, thereby causing the convex outer surface of said vertical curved panel to contact the snow and impact it so that the snow will flow around and be displaced by said apparatus.

4,094,544
PALLET PULLING DEVICE

David L. Spaine, Rte. #4, Dixon, Ill. 61021

Filed Nov. 1, 1976, Ser. No. 737,652
Int. Cl.[2] B66C 1/00
U.S. Cl. 294—82 R 3 Claims



1. The combination with a load-bearing pallet embodying a

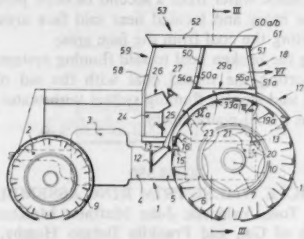
pair of longitudinally extending side ribs and a load-bearing panel consisting of longitudinally spaced transverse planks extending between said side ribs, of a pallet pulling device in the form of a hook member embodying an elongated horizontal body portion having its forward end turned laterally at a right angle to provide a short linearly straight hook portion, said body portion being disposed with its forward end portion abutting squarely against one of said horizontal planks and with the hook portion projecting vertically between said one plank and the next adjacent forward plank and resting squarely against the forward edge of the latter plank, the effective height of said hook portion being slightly less than the thickness of the planks, and a relatively short pull chain consisting of a series of interlocked chain links, the forward link of said pull chain being fixedly welded to the rear end of said body portion in overhanging relationship, the individual links of said pull chain being designed for cooperation with a hook which is carried by one end of a pull line, the rear edge of said body portion being rounded to provide an arc on the order of 180°, thus affording a taper designed for camming engagement with an object which may be in the pull path of the device.

4,094,545

VEHICLE CAB STRUCTURE, ESPECIALLY FOR THE TRACTORS OF THE AGRICULTURAL OR CONSTRUCTION TYPE

Peter Kramer, Spich, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Aug. 17, 1976, Ser. No. 715,938
Claims priority, application Germany, Aug. 19, 1975, 2536820
Int. Cl.² B60J *1/00*
U.S. Cl. 296—28 C **19 Claims**



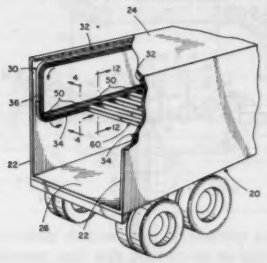
1. A vehicle cab structure, especially for mounting on the frame of an agricultural or a construction tractor, and having a roof section and a lower section respectively forming a side wall also forming a fender which takes up supporting forces effective parallel to the wall and posts extending in the up and down direction between said sections, said cab structure comprising in combination: a pair of laterally spaced members forming a portion of said lower section and each comprising a generally vertical metal panel, a horizontal panel connected to and extending outwardly from the upper edge of each vertical panel, and an inclined, transversely extending front panel having the inner edge connected to the forward edge of said vertical panel and the top edge connected to the forward edge of said horizontal panel and reinforcing the forward end of said horizontal panel against deflection, a transverse beam interconnecting the lower ends of said front panels, means connecting said beam to the tractor frame, upstanding bend resistant brace elements connected to the rear edges of said vertical panels and near the rear axle of the tractor when the cab structure is mounted thereon, and means connected to said brace elements and to the rearward ends of said horizontal panels to brace at least the rearward ends of the latter against deflection, the posts extending between the roof section and the lower section engaging said horizontal panel near the forward and rearward ends respectively of said horizontal panels.

4,094,546

ROLL AWAY DECKING SYSTEM

John J. Glassmeyer, Glenwood, Ill., and Joseph T. Kelley, Hamilton, Ohio, assignors to Pullman Incorporated, Chicago, Ill.

Filed Oct. 26, 1976, Ser. No. 735,290
Int. Cl.² B62D *25/20*
U.S. Cl. 296—28 M **23 Claims**



1. A rollaway decking system for transport vehicle provided with spaced vertical sidewalls, comprising;

a track mounted on each sidewall comprising a storage track section and an operative track section; and

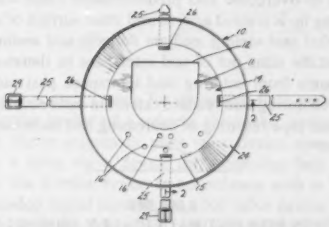
a flexible movable deck extending between said tracks and means on each sidewall for operatively interconnecting the track sections of the track mounted thereon to permit said deck to be moved between storage and operative positions, and means for selectively positioning said track sections at different operative elevations with respect to each other.

4,094,547

COMBINATION BUMPER TRAY APPLIANCE

Arthur T. Zampino, and Dolores V. Zampino, both of 120 Beach 19 St., Far Rockaway, N.Y. 11691

Filed Feb. 7, 1977, Ser. No. 765,922
Int. Cl.² A47D *15/00*
U.S. Cl. 297—182 **8 Claims**

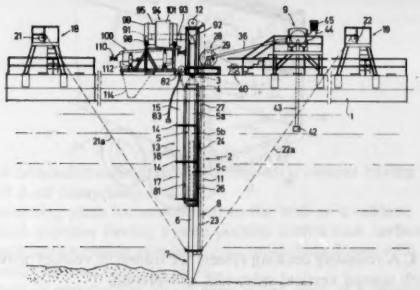


1. An appliance adapted to be used with a chair as a combination bumper tray and toy holder which comprises a semi-rigid, unitary circular or oval tray provided with an off-center solid U-shaped opening of sufficient size to accommodate the body of a child with the straight edge of the U-shaped opening fitting over the backrest of a chair, said tray comprising a horizontal radial surface of lesser depth in the rear portion than the front portion thereof, integral with an upwardly and outwardly inclined circumferentially continuous surface of equal depth in its entirety, the front portion of said horizontal surface being provided with round sized apertures for removably receiving toys and feeding plates mounted on round or oval equally sized ball ends adapted to frictionally fit into said sized apertures.

4,094,548
APPARATUS FOR CONVEYING AND SEPARATING LOOSE MATERIAL

Ludwig Lorenz Schnell, Aufhausen, Germany, assignor to Schuttgutfordertechnik AG, Zug, Switzerland

Continuation of Ser. No. 521,461, Nov. 6, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,653
Claims priority, application Germany, Nov. 8, 1973, 2355831
Int. Cl.[2] E02F 3/88, 7/00
U.S. Cl. 299—9 25 Claims



1. In an apparatus for conveying loose material, a combination comprising a substantially vertically extending conveyor line including at least an upper outer pipe which is immovable in the axial direction thereof, and a lower inner pipe surrounded by said upper outer pipe and being extendable and retractable relative thereto, said pipes having respective telescoped-together portions which bound an annular interspace with one another; sealing means for sealingly closing longitudinally spaced end regions of said interspace, including an upper sealing sleeve disposed at the upper end of said lower inner pipe and having an elastically deflectable sealing lip which is pressed against the inner surface of said upper outer pipe with a predetermined force; and means for maintaining a fluid seal in said interspace, including a sealing medium feedline communicating with said interspace in the region of the lower end of said upper outer pipe, and a sealing medium pump communicating with said sealing medium feed line and feeding said sealing medium into said interspace at an elevated pressure sufficient to overcome said predetermined force with which said sealing lip is pressed against said inner surface of said outer pipe, so that said sealing medium deflects said sealing lip and flows past the same out of said interspace to thereby prevent contaminants from entering said interspace past said sealing means even during said relative extension and retraction of said lower inner pipe resulting in decreasing and increasing of said interspace.

4,094,549
PROCESS FOR HYDRAULICALLY MINING COAL EMPLOYING A CUTTING MONITOR AND A BREAKING MONITOR

Kouichi Shoji, Nihonbashi-Muromachi, Japan, and Arthur W. T. Grimley, Fernie, Canada, assignors to Kaiser Resources Ltd., Vancouver, Canada, by said Arthur Grimley and Mitsui Mining Co., Ltd., Tokyo, Japan, by said Kouichi Shoji

Continuation of Ser. No. 519,643, Oct. 31, 1974, abandoned, which is a division of Ser. No. 350,509, Apr. 12, 1973, abandoned. This application Nov. 12, 1976, Ser. No. 741,489
Claims priority, application Canada, Apr. 13, 1972, 139608
Int. Cl.[2] E21C 41/00
U.S. Cl. 299—17 15 Claims

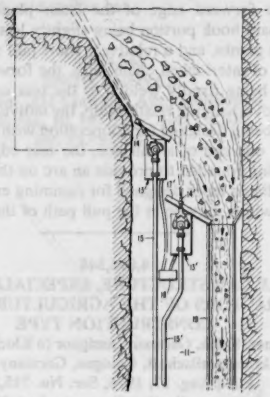
1. The method of hydraulically mining coal from a panel of coal of preselected average thickness comprising:

(1) driving at least one entry upward through the panel to a predetermined terminus thereof at an average slope of at least about 5 degrees;

(2) installing a fluming system in said entry that slopes in the same direction as the entry;

(3) positioning a monitor within said entry, said monitor comprising a nozzle adapted for pivotal motion vertically and horizontally, and being connected to means for receivinng water under pressure;

(4) ejecting a jet of high pressure water from said nozzle



against the panel of coal to cut the coal from the face area of the panel and break the coal into pieces of varying size;

(5) further breaking the cut and broken coal with a jet of high pressure water from a second monitor positioned in the same entry and located near said face area prior to transporting the coal from the face area;

(6) feeding the broken coal to said fluming system; and

(7) transporting the mined coal with the aid of gravity through said sloping fluming system with water from the nozzle as a coal-water slurry.

4,094,550
VEHICLE WHEEL TRIM RING ASSEMBLY

Desmond J. Toal, Valdosta; John Matthew McKenzie, Lake Park, both of Ga., and Franklin Delano Hemby, Warren, Mich., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 20, 1975, Ser. No. 551,095
Int. Cl.[2] B60B 7/00
U.S. Cl. 301—37 R 5 Claims

1. A wheel cover assembly comprising a retaining ring member having a circle of radially resilient teeth at one end thereof and an initially radially directed and axially facing margin at

the other end thereof and terminating in a sharp terminal edge, and a trim ring member having an outer annular and axially facing margin;

wherein said margin of said retaining ring is provided with a reinforced portion formed from the initial plane of said margin of said retaining ring member and of a single thickness of the material of said margin of said retaining ring member, wherein the sharp terminal edge of said margin is spaced and extends radially outwardly from said reinforced portion; and

wherein said annular margin of said trim ring member includes a portion which is folded over the axially inwardly and outwardly facing sides of said terminal edge and clinched about said reinforced portion of said retaining ring member, and wherein said folded over portion is provided with a series of circumferentially spaced indentations on the axially inwardly facing side of said folded over portion which indentations project axially outwardly to grippingly engage the axially inwardly facing side of said reinforced portion of said retaining ring member.

4,094,551

MATERIAL CONVEYING SYSTEMS

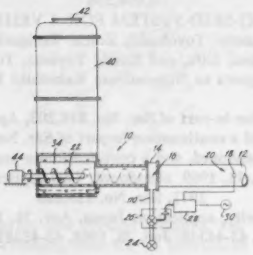
Robert James Flain, Stevenage, and Roy Farley, Hitchin, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 2, 1976, Ser. No. 692,050

Claims priority, application United Kingdom, Jun. 4, 1975, 24124/75

Int. Cl.² B65G *53/04*

U.S. Cl. 302—26 **7 Claims**



1. A conveyor system for materials, the conveyor system comprising a duct along which the material is to be conveyed, a separating means operative for a given period of time for displacing material in the duct downstream of the separating means further downstream away from material in the duct upstream of the separating means, a detector device positioned at a specific duct location downstream of the separating means for detecting presence of material in the duct at said location to control the operation of the separating means and control means for causing further operation of said separating means for a further period when said detector device indicates the continued presence of material at the end of said given period of time.

4,094,552

ARRANGEMENT FOR PNEUMATIC TRANSPORTING OF MATERIALS

Joachim Mellor, Bienrode, Germany, assignor to Buhler-Miag GmbH, Braunschweig, Germany

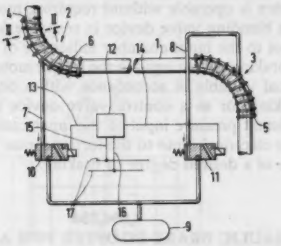
Filed Dec. 22, 1976, Ser. No. 753,485

Claims priority, application Germany, Jan. 8, 1976, 2600546

Int. Cl.² B65G *53/04, 53/54*

U.S. Cl. 302—29 **15 Claims**

1. In an arrangement for pneumatic transporting of materials, particularly those having a tendency to form deposits, a combination comprising a conduit adapted for transporting of the materials and having a resiliently deformable wall; a substantially rigid supporting element arranged outwardly of said wall so as to define a gap with the same; and a hollow intermediate member located in said gap and adapted to intermittently bulge to a size exceeding the size of said gap between said wall



and said supporting element and to thereby bear upon said supporting element and said wall so as to intermittently inwardly resiliently deform said wall whereby deposits of said materials which tend to form on an inner surface of said wall are dislodged.

4,094,553

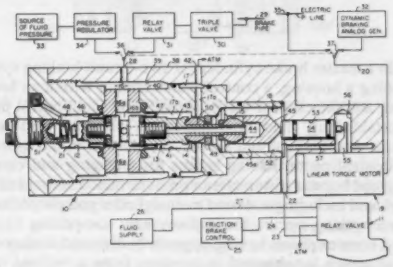
BRAKE CONTROL SYSTEM HAVING AN ELECTRO-PNEUMATIC PILOT VALVE

Glen O. Bohusch, and Walter E. Rojecki, both of Watertown, N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Jul. 28, 1977, Ser. No. 819,907

Int. Cl.² B60T *7/12*

U.S. Cl. 303—3 **8 Claims**



1. A brake control system for governing fluid pressure control of friction brakes of a vehicle, the brake control system having an electro-pneumatic pilot valve device operably connected to a relay valve device for governing fluid pressure control of the friction brakes in accordance with at least one variable analog signal input to the pilot valve device, wherein an improved electro-pneumatic pilot valve device comprises;

(a) a valve plunger having valves disposed thereon for governing development of a pilot fluid pressure control signal,

(b) input, vent, and pilot chamber means associated with the valves of the plunger for at times charging the pilot chamber from the input chamber through one of the valves and at other times reducing the pilot pressure through another one of the valves and the vent chamber,

(c) linear torque motor means governed by a variable input electrical signal for applying a force axially to the plunger in a direction to open said another valve for reducing pressure in the pilot chamber in accordance with an increase in magnitude of the electrical signal input to the torque motor,

(d) self-lapping means for governing axial movement of the plunger to lap said another valve in accordance with a

combination of the axial force on the plunger developed by the torque motor and an axial force on the plunger generated by pressure in the pilot chamber substantially balancing an opposing axial force on the plunger generated by pressure in the input chamber, and

(e) whereby the improved electro-pneumatic pilot valve device is operable without requiring modification, either as a blending valve device in response to a variable fluid input to the input chamber indicative of a desired degree of braking and an input to the torque motor of an electrical signal variable in accordance with a degree of dynamic braking, or as a control valve device in response to a constant pressure input to the input chamber and a variable electrical input to the torque motor inversely indicative of a desired degree of braking.

4,094,554

HYDRAULIC BRAKE BOOSTER FOR A VEHICULAR BRAKE SYSTEM

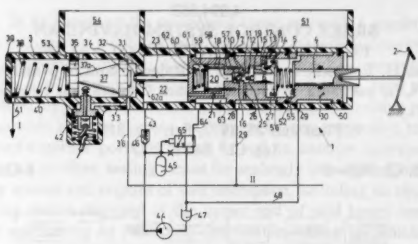
Heinz Leiber, Leimen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 7, 1977, Ser. No. 775,220

Claims priority, application Germany, Mar. 10, 1976, 2609905

Int. Cl.² B60T *13/16*

U.S. Cl. 303—52 **4 Claims**



1. In a master brake cylinder for two-circuit braking systems including a housing, a control piston sliding within an booster piston, a brake control valve, actuated by said control piston, for establishing fluid communication between said master cylinder and the first and second of said two brake cylinders, said control piston having means for engaging and carrying along said booster piston after a predetermined amount of axial travel, and including a second main cylinder and piston for said second braking circuit, the improvement comprising:

said booster piston having oppositely disposed surfaces, one of which is subjected to pressure from a resilient means and the other of said surfaces being subjected to pressure flow from a pump and

means associated with said booster piston serving to cooperate with a stop means and further arranged to sense loss of pressure flow.

4,094,555

ANTI-SKID CONTROL METHOD AND APPARATUS FOR A BRAKE-EQUIPPED VEHICLE WHEEL

Peter Cyril Byrne, and Desmond F. Moore, both of Dublin, Ireland, assignors to PCB Controls Ltd., Dublin, Ireland

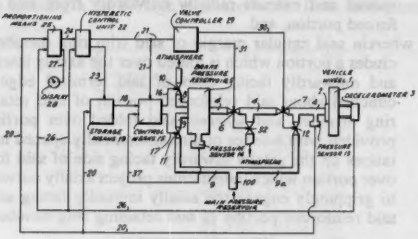
Filed Apr. 25, 1977, Ser. No. 790,693

Claims priority, application Ireland, Nov. 26, 1976, 2597/76

Int. Cl.² B60T *8/08*

U.S. Cl. 303—100 **35 Claims**

1. An anti-skid control method for a vehicle wheel comprising the steps of detecting deceleration of the vehicle wheel and comparing the same with a reference value of minimum deceleration and also with a reference value of maximum deceleration, controlling brake force based on the comparing step so that, independently of the position of the brake operating means controlled by the driver during braking, said brake force is released from said wheel if the actual deceleration of said wheel exceeds said reference value of maximum deceleration, whereas the brake force is reapplied to the wheel if the actual deceleration of said wheel decreases below said reference value of minimum deceleration, and varying said reference value of maximum deceleration during braking in dependence of a value characteristic of the maximum frictional forces transferable between the wheel and the road surface, said



method further comprising applying the brake force by pressure from a brake pressure reservoir, and varying said pressure during a braking operation by adjusting the reservoir brake pressure to the pressure level which was actually operating on the brake at the time when the reference value for maximum deceleration value was reached, said adjusting of the reservoir brake pressure being effected after the reservoir brake pressure has been released from the brake.

4,094,556

ANTI-SKID SYSTEM FOR A VEHICLE

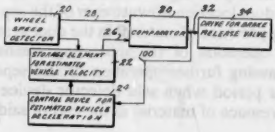
Atutoshi Okamoto, Toyohashi; Koichi Taniguchi, Kariya; Yoshiaki Nakano, Gifu, and Koichi Toyama, Toyohashi, all of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya, Japan

Continuation-in-part of Ser. No. 816,203, Apr. 15, 1969, abandoned, and a continuation-in-part of Ser. No. 816,928, Apr. 17, 1969, abandoned, and a continuation-in-part of Ser. No. 832,192, Jun. 11, 1969, abandoned. This application Mar. 11, 1971, Ser. No. 123,228

Claims priority, application Japan, Apr. 24, 1968, 43-27844; Jun. 26, 1968, 43-44348; Jun. 28, 1968, 43-45381; Jul. 13, 1968, 43-49499

Int. Cl.² B60T *8/10*

U.S. Cl. 303—109 **8 Claims**



3. An improved anti-skid system for vehicle which effectively utilizes an approximated slip ratio between vehicle velocity and wheel velocity to generate a brake release signal for a brake release valve without actually utilizing a vehicle velocity detector, said improved system comprising:

a wheel speed detector means for generating a wheel speed signal corresponding to the instantaneous wheel speed of at least one wheel of said vehicle;

a vehicle velocity estimation means connected to said wheel speed detector means for generating a vehicle velocity signal proportional to the successive maximum magni-

tudes of instantaneous wheel speed but reduced from such maximum values at a controlled rate;

control circuit means connected with said wheel speed detector means and with said vehicle velocity estimation means and producing a brake release signal whenever the difference between the wheel speed signal and the vehicle velocity signal reaches a predetermined level;

feedback means connected to control at least one of said wheel speed detector means and said vehicle velocity estimation means in response to the occurrences of said brake release signal;

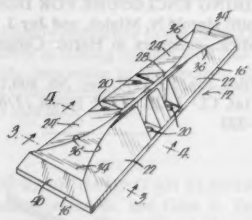
said feedback means being connected to the vehicle velocity estimation means so as to increase the controlled rate at which the vehicle velocity signal is reduced in response to the occurrence of a brake release signal thereby advancing the phase of brake reapplication in anticipation for and compensation of inherent time lags in the hydraulic brake system of the vehicle.

4,094,557

COMBINATION LOW GROUND PRESSURE, LOW TURNING RESISTANCE AND SELF-CLEANING TRACK SHOE

Larry E. Miller, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Oct. 18, 1976, Ser. No. 733,521
Int. Cl.[2] B62D *55/28*
U.S. Cl. 305—54 **9 Claims**



1. A combination low ground pressure, low turning resistance, and self-cleaning shoe for an articulated endless track used on track-type vehicles comprising:

a body having a sloping forward surface and a sloping rearward surface, each said forward and rearward surface substantially converging toward the other;

a traction lug projecting from said body between said forward and rearward surfaces and terminating at opposite ends at locations spaced from opposite ends of said body; and

a high-flotation bearing surface on each end of said body between said forward and rearward surfaces, each said bearing surface having a portion adjacent to, and of the same width as said lug and each said bearing surface increasing in width with increasing distance from said lug toward an adjacent end of said body, each of said bearing surfaces sloping away from said lug toward the adjacent end of said body.

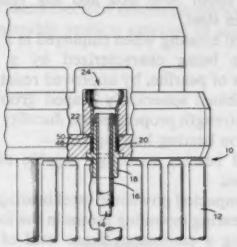
4,094,558

LOCKING NUT ASSEMBLY WITH DEFORMABLE LOCKING SLEEVE

David Wayne Christiansen, Kennewick, Wash., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,312
Int. Cl.[2] F16C *33/00*
U.S. Cl. 308—3 R **4 Claims**

1. A locking nut assembly for attachment of a threaded element with at least one channel to a support member comprising: a nut for engagement with the threaded element, the nut being provided with at least one opening, a locking sleeve for insertion within the nut, the sleeve being formed with at least one prong in parallel alignment with the channel of the threaded element, the prong being formed with a foot adapted to interact with the support member to inhibit relative motion



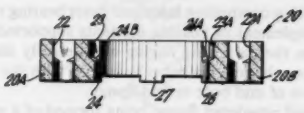
therebetween, and at least one portion of the inserted locking sleeve being deformed to fill the opening of the nut to restrain relative movement of the nut with respect to the threaded element.

4,094,559

FLANGED BEARING CARTRIDGE

Ronald S. Slusarski, Berlin, Conn., assignor to Textron Inc., Providence, R.I.

Filed Dec. 30, 1976, Ser. No. 755,655
Int. Cl.[2] F16C *23/08, 35/06*
U.S. Cl. 308—194 **8 Claims**



1. A sintered compacted powdered steel bearing flange housing, said housing comprising,

bearing mounting means in the form of a circular bore having a continuous inner wall of predetermined axial thickness located centrally of said sintered housing and passing axially through the plane of said housing,

said continuous inner wall having a spherically shaped groove machined along its periphery for receiving an annular antifriction bearing assembly having inner and outer rings with a complement of bearing balls held therebetween, said outer ring being shaped for spherically mating with said spherical groove,

end flange means extending radially from said circular bore of said flange housing,

said end flange means being substantially flat and each having bolt-receiving holes therein, each located centrally along a line passing diametrically across said circular bore,

and a pair of diametrically oppositely disposed axial-access slots located on said inner wall and extending partially axially into said circular bore and merging with the spherically-shaped groove of said inner wall,

each of said slots having a bevelled bottom shoulder formed by compaction,

the width of said slots being sufficient to enable the axial insertion of said annular antifriction bearing assembly across its diameter therein into said bore, such that when said bearing is inserted into said slots and rotated about its diameter, said annular bearing assembly is caused to fit snugly into the spherical groove of said bore, said sintered powdered housing being formed of a steel composition and having a sintered density ranging

from about 80 to 92% of the theoretical density of said steel composition,

said steel composition consisting essentially by weight of up to about 6% Ni, up to about 3% Cu, up to about 2% Mn and/or silicon, about 0.2 to 1.2% C and the balance at least about 90% iron and any residuals normally present in steel,

said sintered housing when employed in a flanged bearing cartridge being characterized by a metallographic structure of pearlite, by improved resistance to wear at the machined spherically shaped groove, and by improved strength properties and ductility as compared to a cast iron bearing housing.

5. A flanged bearing cartridge capable of self-alignment which comprises,

a sintered compacted powdered steel bearing flange housing having a bearing mounting means in the form of a circular bore having a continuous inner wall of predetermined axial thickness located centrally of said housing and passing axially through the plane of said housing,

said continuous inner wall having a spherically shaped groove machined along its periphery and a pair of diametrically disposed axial-access slots located on said inner wall and extending partially axially into said circular bore and merging with the spherically shaped groove of said inner wall, the width of said slots being sufficient to enable the axial insertion and mounting of an annular antifriction bearing assembly into said bore in spherical mating relationship with said spherically shaped groove,

each of said slots having a bevelled bottom shoulder formed by compaction,

and an annular antifriction bearing mounted in said flange bore,

said bearing comprising inner and outer bearing rings with a complement of bearing elements supported therebetween, the outer ring having a spherically shaped surface in spherical mating relationship with the spherical groove of said bore in said flange,

said sintered powdered flange being formed of a steel composition and having a sintered density ranging from about 80 to 92% of the theoretical density of said steel composition,

said steel composition consisting essentially by weight of up to about 6% Ni, up to about 3% Cu, up to about 2% Mn and/or Si, about 0.2 to 1.2% C and the balance at least about 90% iron and any residuals normally present in steel,

said sintered housing in said bearing cartridge being characterized by a metallographic structure of pearlite, by improved resistance to wear at the machined spherically shaped groove, and by improved strength properties and ductility as compared to a cast iron bearing housing.

4,094,560

V-GROOVE ROLLING CONTACT ROLLER BEARING

Earl W. Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811

Division of Ser. No. 511,237, Oct. 2, 1974, Pat. No. 3,989,324.
This application Jul. 16, 1976, Ser. No. 705,953
Int. Cl.[2] F16C *33/51*
U.S. Cl. 308—206 **1 Claim**

1. A rolling contact roller bearing comprising:

an inner bearing race,

only one retainer race,

said inner bearing race and said retainer race being circular and coaxial,

said retainer race being located radially outwards of said inner race and affixed thereto,

an outer bearing race,

said outer bearing race being circular, coaxial with said inner race and said retainer race, and free to rotate relative thereto,

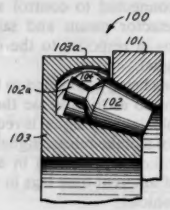
first rotating means,

said first rotating means comprising rollers,

said rollers each including a V-grooved portion at one end, second rotating means,

said second rotating means comprising balls,

said balls being alternately interposed between said V-



grooves and in rolling contact therewith and with said retainer race, so as to prevent said rollers from contacting each other,

said balls each making only one contact with said retainer race,

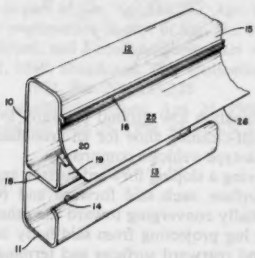
said rollers being in rolling contact with said inner race and with said outer race, so as to transfer loads therebetween.

4,094,561

WIRING ENCLOSURE FOR DESKS

Douglas F. Wolff; Harold N. Minick, and Jay J. Reinhart, all of Marshall, Mich., assignors to Harter Corporation, Sturgis, Mich.

Filed Jun. 20, 1977, Ser. No. 808,188
Int. Cl.[2] A47B *77/08*; H01R *13/60*
U.S. Cl. 312—223 **5 Claims**



1. An elongated tubular integral wiring enclosure adapted for mounting at and extending above the rear of a desk top comprising walls forming an upper longitudinal compartment having a front wall, a longitudinal access slot formed in said front wall with an angular attaching flange along its lower edge for attachment to the desk top, walls forming a lower compartment under the upper compartment and a coextensive flexible wiper strip secured to the upper edge of said access slot and extending downwardly and forwardly over said attaching flange to conceal the same and to contact the desk top surface.

4,094,562

TRUCK BODY DOOR ASSEMBLY

Irven R. Wilhelmsen, 6359 Dominica St., Cypress, Calif. 90630

Filed Sep. 29, 1975, Ser. No. 617,314
Int. Cl.[2] F02N *11/06*
U.S. Cl. 312—290 **2 Claims**

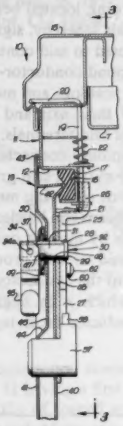
1. In combination:

a door assembly including a wall frame having a rectangular opening and a door supported on said frame to swing downward about the lower edge of said opening;

a tool tray extending horizontally inwardly from the upper edge of said wall frame;

a cover for said tray;

key-lockable manually operable latch means mounted in said door for holding said door in opening covering position, said door, when unlocked, being swingable downwardly



and outwardly from closing relation with said opening; and

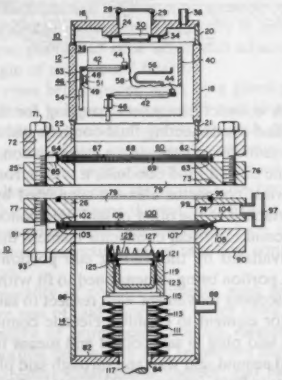
means automatically responsive to the closing of said door to lock said cover in closing relation with said tool tray, and automatically responsive to the opening of said door to release said cover permitting access simultaneously to said tray and to said door opening.

4,094,563

METHOD OF FABRICATING AN ELECTRON TUBE

Robert A. Simms, Horseheads, and Gene R. Feaster, Elmira, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 9, 1967, Ser. No. 660,875
Int. Cl.[2] H01J *9/18*
U.S. Cl. 316—19 **6 Claims**



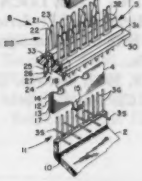
1. A method of fabricating an electron discharge device including the steps of providing a first chamber portion having a first penetrable portion disposed between the interior and exterior thereof, forming an electrode within said first chamber portion, providing a second chamber portion having a second penetrable portion disposed between the interior and exterior thereof, forming a portion of said electron discharge device to be associated with said electrode, connecting said first and second chamber portions to form a third chamber portion therebetween, penetrating said first and second penetrable members and moving said electrode and said portion of said electron discharge device together so that said portion of said electron discharge device and said electrode may be assembled to form an evacuated electron discharge device with said first and second penetrable portion exterior of said electron discharge device.

4,094,564

MULTIPLE CONDUCTOR ELECTRICAL CONNECTOR WITH GROUND BUS

Santo J. Cacolici, Mentor, Ohio, assignor to A P Products Incorporated, Painesville, Ohio

Filed Mar. 17, 1977, Ser. No. 778,580
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 L **22 Claims**



1. A cable termination assembly comprising a multiconductor cable, a plurality of contacts connected electrically to respective conductors of said cable, bus means for electrically connecting respective conductors of said cable, and dielectric body means for holding together said contacts, said bus means, and said cable, said body means including carrier means molded directly about and to said contacts for holding the same in a fixed pattern, said carrier means also including further means for holding said bus means thereto in electrical isolation from at least one of said contacts.

4,094,565

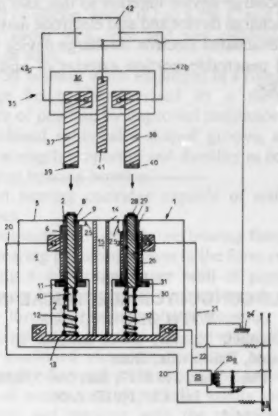
SAFETY ELECTRIC CONNECTOR

André Parrier; Jean Parrier, and Henri Parrier, all of rue de la Sabliere, St. Genis les Ollieres (Rhone), France

Filed Dec. 13, 1976, Ser. No. 749,791
Claims priority, application France, Dec. 12, 1975, 75 39398
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 P **10 Claims**

1. A safety electric connector comprising a socket wherein each terminal comprises at least one conductive tubular part connectable to an electric supply; a conductive pin slidably mounted inside each tubular part, said conductive pin being connected to an earth terminal, each conductive pin further

being disposed inside an insulating sheath while the wires of the socket are connected to a fault detecting apparatus; and an



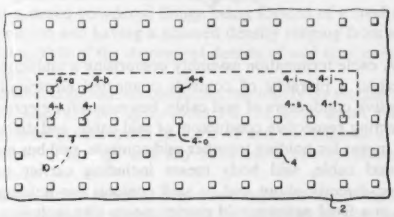
insulating moulding encapsulating said at least one tubular part.

4,094,566

CONNECTOR HAVING WIRE LOCATING MEANS

Frank Peter Dola, Port Richey, and Frederick William Rossler, Jr., New Port Richey, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 18, 1977, Ser. No. 770,127
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 R **34 Claims**



1. A mutli-contact electrical connector which is intended for use with a multi-conductor cable of the type comprising a plurality of signal conductors and a plurality of ground conductors, said connector comprising:

a connector housing, said housing having a mating end, a rearward end, and a laterally facing side which extends between said mating end and said rearward end,

a plurality of contact terminals in said housing, each of said terminals having a contact portion and a wire-receiving portion which receives a wire upon movement of said wire laterally of its axis towards said side and into said wire-receiving portion, said terminals being arranged in side-by-side relationship on said side of said housing in a row with said contact portions adjacent to said mating end and with said wire-receiving portions between said ends,

a commoning conductor means on said laterally facing side extending across said side of said housing proximate to said rearward end, a plurality of ground conductor receiving members on said commoning conductor means, said ground conductor receiving members each having a functional position and a non-functional position, said ground conductor receiving members being effective to receive, and establish electrical contact with, a ground conductor when in said functional position and being spaced from a conductor extending across said surface when in said non-functional position,

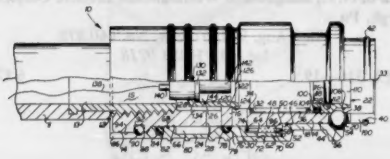
selected ground conductor receiving members being in alignment with said conductor-receiving portions of said contact terminals, and at least one ground conductor receiving member being located between each two adjacent contact terminals whereby, signal conductors in said cable can be connected to said contact terminals by placing said selected ground conductor-receiving members in said non-functional positions and moving said signal conductors laterally of their axis and into said conductor-receiving portions of said terminals, and said ground conductors can be commonly connected to said commoning conductor means by moving said ground conductors into said ground conductor receiving members, and said commoning conductor means can be electrically connected to one of said terminals by moving one of said ground conductors into one of said selected ground conductor receiving members and into the conductor receiving portion of the one terminal which is in alignment with said one selected ground conductor receiving member.

4,094,567

COMBINATION QUICK CONNECT-DISCONNECT PNEUMATIC/ELECTRICAL COUPLING

Thomas D. Karcher, Rocky River, and Harry H. Hammond, North Royalton, both of Ohio, assignors to The Hansen Manufacturing Company, Cleveland, Ohio

Filed Jan. 5, 1977, Ser. No. 756,759
Int. Cl.[2] H01R *3/04*
U.S. Cl. 339—15 **13 Claims**



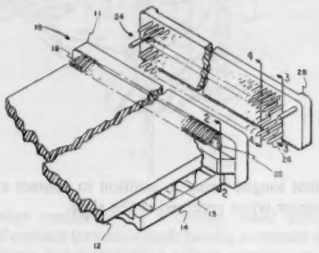
1. A quick connect-disconnect coupling for simultaneously connecting and disconnecting fluid conduits and the ends of an electrical conductor comprising a combination, a socket attached to one of said fluid conduits, a wall across said socket; a first electrical connector element supported by said wall; a fluid plug attached to the other of said fluid conduits, said plug having a second electrical connector element disposed within and circumvallated by the leading end portion thereof, said leading end portion being dimensioned to fit within said socket and for telescoping movement with respect to said first electrical connector element to establish electric connection, means for holding said plug in said socket and means for directing a flow of fluid around said wall and through said plug to connect said conduits in fluid communication with each other including a manually operable valve member selectively movable between an open condition and a closed condition when said plug and socket are in the connected condition, said valve member being effective to prevent fluid flow around said wall when said valve member is in the closed condition and block fluid flow between said conduits, said valve member being effective to allow fluid to flow around said wall when said valve is in the open condition and enable fluid flow between said conduits.

4,094,568

ELECTRICAL CROSSOVER AND TEST CONNECTORS

Laurence Saul Lee, New Hartford, and Joseph Philip Roback, Utica, both of N.Y., assignors to General Electric Company, Utica, N.Y.

Continuation of Ser. No. 699,728, Jun. 24, 1976, abandoned.
This application Sep. 26, 1977, Ser. No. 836,190
Int. Cl.[2] H05K *1/07*
U.S. Cl. 339—17 LM **2 Claims**



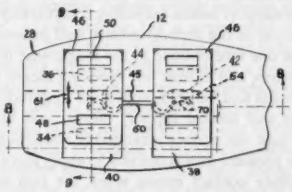
1. A circuit board connection assembly, comprising:
a first circuit board **12** having a first margin along which are fixed a first plurality of spaced apart contacts;
a second circuit board **14** having a second margin along which are fixed a second plurality of spaced apart contacts;
means **13** fixing said first and second boards together in a spaced apart, parallel relationship with said first and second margins adjacent each other;
a receptacle body having
a first portion interlocked with said first and second boards;
a second portion having
a first and a second face, said first face being adjacent said boards and said second face being remote from said boards,
a first plurality of transverse bores, each extending between said faces and having a progressive enlargement onto said second face, disposed alternately in an upper and a lower row, parallel to each other, and adjacent said first margin of said first board,
a second plurality of transverse bores, each extending between said faces and having a progressive enlargement onto said first face, disposed alternately in an upper and a lower row, parallel to each other, and adjacent said second margin of said second board,
said upper rows being spaced apart by a given distance,
said lower rows being spaced apart by said given distance,
a first plurality of contact elements **20**, each disposed in a respective one of said upper and lower rows of said first plurality of bores, each contact element having a female portion disposed in said respective bore but not in said progressive enlargement thereof, and having a lead portion **16** extending from said respective bore through said first face to a respective one of said first contacts of said first board,
a second plurality of contact elements, each disposed in a respective one of said upper and lower rows of said second plurality of bores, each contact element having a female portion disposed in said respective bore but not in said progressive enlargement thereof, and having a lead portion extending from said respective bore through said first face to a respective one of said second contacts of said second board,
a cross-over connector body **24** having
a first face and a second face, said first face disposed adjacent said second face of said connector body and said second face remote therefrom,
a first plurality of transverse bores extending inwardly and having a progressive decrement from said second face of said connector body, disposed alternately in an upper and a lower row, parallel to each other,
a second plurality of transverse bores extending inwardly and having a progressive decrement from said second face of said connector body, disposed alternately in an upper and a lower row, parallel to each other,
a third plurality of contact elements each communicating with a respective one of said upper and lower rows of said first plurality of bores of said connector body and passing through said first face of said connector body and through said second face of said receptacle body into the female portion of a respective one of said first plurality of contact elements of said receptacle body,
a fourth plurality of contact elements, each communicating with a respective one of said upper and lower rows of said second plurality of bores of said connector body and passing through said first face of said connector body and through said second face of said receptacle body into the female portion of a respective one of said second plurality of contact elements of said receptacle body,
said third and fourth pluralities of contact elements thereby forming an array of rows and columns wherein each column contains two contact elements,
a plurality of conductive elements **27** disposed within said connector body in predetermined ones, but not all, of said columns, electrically connecting the respective third contact element of said one column with the respective fourth contact element of said one column.

4,094,569

SAFETY CAP SLIDE

Ernest W. Dietz, Torrance, Calif., assignor to Pacific Electricord Company, Gardena, Calif.

Filed May 9, 1977, Ser. No. 794,845
Int. Cl.[2] H01R *13/44*
U.S. Cl. 339—40 **7 Claims**



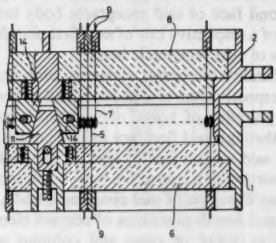
1. An electrical connector for receiving a prong type connector plug comprising:
a body bearing, on at least one of its faces, juxtapositioned, prong-receptacle means to receive a plurality of said connector plugs;
contactor strips carried internally of said body for electrical contact with prongs placed in said prong receptacles;
a plurality of protective plates, each overlying a respective face area inclusive of a respective receptacle means and bearing prong-receiving aperture means;
attachment means comprising dependent brackets projecting from the undersurface of said protective plates inwardly into face-central apertures in said body in sliding relationship therein between aligned and misaligned positions with respective prong receptacles;
slot means in said body open to said face and extending beneath and between adjacent face areas; and
resilient means for each adjacent pair of face areas comprising a spring having a central section received in said slot means and distal S-bowed sections, each resiliently biasing against the center of a respective bracket to urge a respective plate into its misaligned position.

4,094,570

ELECTRICAL CONNECTOR

Ruy F. M. de Barros, Woluwe-St-Lambert, Belgium, assignor to Societe Anonyme belge d'exploitation de la navigation aerienne (SABENA), Belgium

Filed Mar. 11, 1977, Ser. No. 776,781
Claims priority, application Belgium, Nov. 19, 1976, 172530
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—75 M **11 Claims**



1. An electric connector comprising first and second support means having an elongated shape, first and second sets of contact means arranged in at least one layer extending in a plane parallel to the lengthwise direction of a respective support means, each contact means of each set being fixed at one end of a flexible strip having its other end fixed to the respective support means, each strip extending transversely to the lengthwise direction of the support means, each strip being arranged to allow it to bend in the plane of the respective layer of contact means, the said contact means of both sets being arranged to be in an alternating relationship and insulated one from the other when the two sets are engaged one into the other, said contact means having an insulating element such that each contact means of one set electrically cooperates with one contact means of the other set; at least one pressure means on the first support means extending transversely to the lengthwise direction of the support means, said pressure means having at least one face oblique to the lengthwise direction of the support means; and at least one blocking means on the second support means and being mounted for longitudinal movement relative to said second support means, said blocking means having at least one surface arranged to cooperate with the said face of the pressure means thereby to apply force to the contiguous alternate contact means when the two sets of contact means engage one into the other so that transverse mating engagement of one support means with the other produces a pressure in the lengthwise direction of the support means and against said contact means to cause said contact means on the ends of said flexible strips to be directly physically engaged together in vibration-free relation.

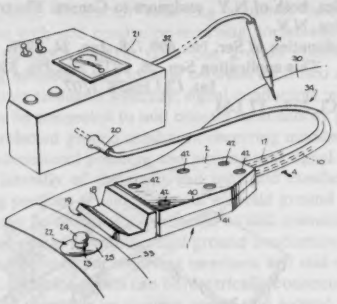
4,094,571

GROUNDING CABLE CLIP

Thomas A. Benjamin, Glen Gardner, N.J., assignor to IPCO Hospital Supply Corporation, White Plains, N.Y.

Filed Apr. 15, 1977, Ser. No. 787,835
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—91 R **26 Claims**

1. A grounding cable clip comprising a power plate and a monitor retaining shoe, said plate and shoe being spaced from each other, said shoe having an upstanding tab portion, said plate having a resilient tongue overlying the tab portion, said shoe having means for receiving a grounding pad connector,



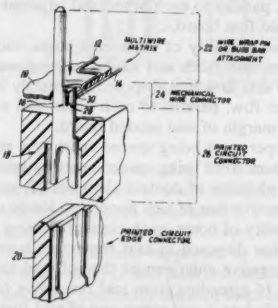
said resilient tongue being in position to contact a grounding pad connector when received in the shoe.

4,094,572

MULTI-WIRE ELECTRICAL INTERCONNECTING MEMBER HAVING A MULTI-WIRE MATRIX OF INSULATED WIRES MECHANICALLY TERMINATED THEREON

Robert Page Burr, Huntington; Ronald Morino, Sea Cliff, and Raymond J. Keogh, Huntington, all of N.Y., assignors to Kollmorgen Technologies, Inc.

Division of Ser. No. 604,204, Aug. 13, 1975, Pat. No. 4,065,850.
This application Jan. 24, 1977, Ser. No. 762,118
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—97 P **2 Claims**



1. A multi-wire electrical interconnection circuit member, comprising:

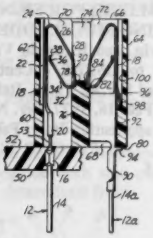
a multi-wire matrix including insulated wires; and

wire-retaining members having a body portion affixed to said circuit member, said body portion having a pin portion extending outwardly from said circuit member, a tapered entrant portion adjacent to said pin and said circuit member and a slotted portion extending downwardly in said body from said tapered entrant portion and away from said pin, said slotted portion including side wall edges for applying an insulation penetration force to the insulated wires therein for forming and maintaining a gas-tight electrical connection therewith.

4,094,573
CIRCUIT BOARD EDGE CONNECTOR

Arvin L. Langham, Canoga Park, Calif., assignor to Elfab Corporation, Dallas, Tex.

Filed Aug. 1, 1973, Ser. No. 384,776
Int. Cl.[2] H05K 1/07
U.S. Cl. 339—176 MP 12 Claims

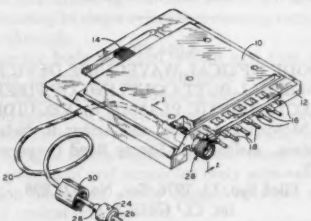


1. An edge connector for a circuit board comprising: a plurality of contact terminals each having a contact head, each of said contact heads including a loop portion; an insulative housing comprising a shell having oppositely disposed outer longitudinal walls and a bottom surface, a member between each of said walls forming cavity means between said member and each respective outer wall, the bottom of each of said cavity means being open, said member having an upper surface portion facing upwardly into each of said cavity means, said shell having an opening above said member to receive a circuit board for insertion along a predetermined axis so that said contact heads establish electrical contact to respective portions on such circuit board, said upper surface portion being substantially normal to said predetermined axis; and mounting means fixedly positioning each respective contact terminal with respect to the bottom surface of said shell; each of said loop portions continuously engaging an edge of the upper surface portion of said member for all operational conditions of the connector to bias said housing against said mounting means.

4,094,574
COAXIAL CABLE CONNECTOR DEVICE AND METHOD OF MANUFACTURE THEREOF

Thomas L. Gunn, P.O. Box 246, Bonaparte, Iowa 52620

Filed Dec. 27, 1976, Ser. No. 754,407
Int. Cl.[2] H01R 17/06
U.S. Cl. 339—177 E 6 Claims

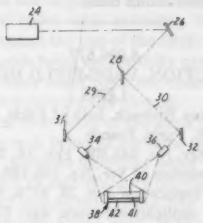


1. In a coaxial cable having a center conductor, an insulating sleeve surrounding the center conductor, and a tubular conductor surrounding the sleeve; connector means on at least one end of the cable comprising different conductive elements electrically engaging the center conductor and the tubular conductor and moldable plastic electrical insulating material in the form of body means molded in situ on the end of said cable and in engagement with said conductive elements thereon for fixing said conductive elements in place and in engagement with said center and tubular conductors, said insulating material holding said conductive elements in spaced electrically insulated relation on the end of the cable; said conductive elements include a socket-like first element electrically engaging the center conductor, a second element having an aperture to receive the insulating sleeve, and when mounted on the sleeve electrically engaging the tubular conductor, said body means of plastic material closely surrounding the cable on both sides of said second element and engaging both of said first and second elements to fix said elements on the cable and to support the elements in spaced electrically insulated relation, said second element having reduced diameter portions extending therefrom from both ends, each said portion being imbedded in and interlocked with said body means of plastic insulating material.

4,094,575
HOLOGRAPHIC ARTICLE AND PROCESS FOR MAKING SAME

Truman F. Kellie, North St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1976, Ser. No. 682,090
Int. Cl.[2] G02B 27/00, 5/18
U.S. Cl. 350—3.67 33 Claims



1. A hologram comprising a sheet material having a permanent, optically detectable pattern which includes at least one linear grating, which grating has a preselected spatial frequency and results from the interference fringe field produced by two intersecting coherent light beams of a predetermined wavelength passing through an optical transparency in substantial contact with a photosensitive medium to impart a holographic image of said transparency in said medium, which medium is then further processed to provide said sheet material with said permanent pattern containing said holographic image, characterized by the feature that the grating is formed by two intersecting coherent light beams which are directed along non-colinear paths to pass through spatial filters and thence directly impinge onto said optical transparency at equal angles of incidence with respect to the plane of the transparency at the point of incidence, such that the formed gratings are free of artifacts such as are produced by lens aberrations or dust.

4,094,576
STRAIGHT-LINE OPTICAL SCANNER USING ROTATING HOLOGRAMS

Gerald Michael Heiling, Pine Island, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 673,183, Apr. 2, 1976, abandoned. This application Apr. 25, 1977, Ser. No. 790,720
Int. Cl.[2] G02B 5/32, 27/17; G03H 1/04
U.S. Cl. 350—3.71 16 Claims

1. A method for producing straight-line optical scan patterns, comprising the steps of:

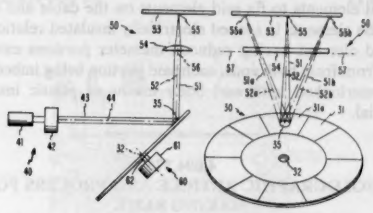
(a) projecting a collimated coherent optical reference beam onto an area of a sensitized medium;

(b) projecting a spherical object beam onto said area through a first cylindrical lens having a first focal line extending in

a first direction in an object plane, so as to produce an optical interference pattern in said area;

(c) developing said medium, so as to fix said interference pattern in said area;

(d) projecting a collimated coherent reconstruction beam onto said medium, so as to generate a reconstructed beam converging toward a line image in said object plane;



(e) transmitting said reconstructed beam through a second cylindrical lens having a second focal line extending in a second direction in said object plane; and

(f) imparting rotary relative motion between said medium and said reconstruction beam.

4,094,577

HIGH-RESOLUTION, WIDE-FIELD HOLOGRAPHIC LENS

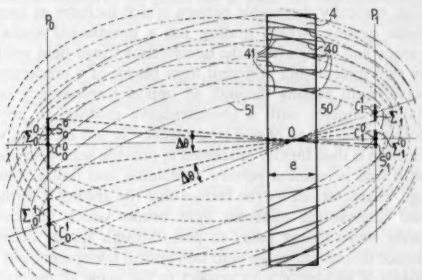
Erich Spitz, and Guy Bismuth, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 443,502, Feb. 15, 1974, abandoned, which is a continuation of Ser. No. 240,140, Mar. 31, 1972, abandoned. This application Jun. 28, 1976, Ser. No. 700,182

Claims priority, application France, Apr. 13, 1971, 71.12966

Int. Cl.² G02B *5/32;* G03H *1/04*

U.S. Cl. 350—3.72 **5 Claims**



1. Holographic lens for optically conjugating a plurality of first elementary surfaces and an equal number of second elementary surfaces with aberrations less than a predetermined limiting value using the angular selection properties caused by Bragg effect of 3-dimensional network;

said lens being constituted by a thick plate of photosensitive material having parallel faces;

said plate comprising as many superimposed 3-dimensional networks made of recorded interference fringes mixed within the volume of said material as there are said first elementary surfaces;

each said network constituting a 3-dimensional holographic elementary iens, each said elementary lens field of view bieng restricted by said angular selection properties;

each said holographic elementary lens respectively conjugating a single said first elementary surface and a single said second elementary surface;

the respective centers of said first elementary surface, said second elementary surface and said holographic lens being substantially aligned along a straight line; and

said plate thickness restricting each said elementary lens field of view to the value for which said aberrations are at most equal to said limiting value.

4,094,578

OPTICAL EQUALIZER FOR SIGNAL-TRANSMISSION SYSTEM USING MULTIMODE LIGHT GUIDES

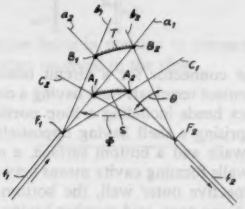
Pietro DiVita, Turin, and Riccardo Vannucci, Rome, both of Italy, assignors to CSELT - Centro Studi e Laboratori Telecomunicazioni S.P.A., Turin, Italy

Filed Feb. 18, 1977, Ser. No. 770,232

Claims priority, application Italy, Feb. 19, 1976, 67380 A/76

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.15 **5 Claims**



1. A system for the optical transmission of signals, comprising:

a first and a second light guide with internally reflecting boundaries respectively connected to a transmitter and a receiver of luminous signals, said light guides having proximal ends respectively emitting and collecting bundles of light rays with axes angularly intersecting in a common plane, each bundle being bounded by a pair of limiting rays on opposite sides of the respective axis; and

a mirror confronting said proximal ends for reflecting light rays from said first light guide to said second light guide, said mirror having a cross-section in said common plane in the shape of a segment of an ellipse whose foci are the center points of said proximal ends within said common plane, said segment extending between the intersection of the axis of said first light guide with the position of a limiting ray of said second light guide and the intersection of the axis of said second light guide with the position of a limiting ray of said first light guide.

4,094,579

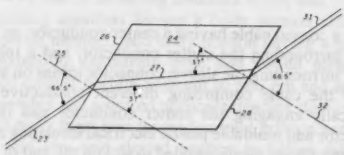
MULTIMODE OPTICAL WAVEGUIDE DEVICE WITH NON-NORMAL BUTT COUPLING OF FIBER TO ELECTRO-OPTIC PLANAR WAVEGUIDE

Donald H. McMahon, Carlisle, and Arthur R. Nelson, Stow, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sep. 13, 1976, Ser. No. 722,898

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.17 **9 Claims**



1. An optical waveguide device comprising:

a planar optic waveguide having an index of refraction n_1

and an end region whereat light energy is coupled for guidance therein;

a fiber optic waveguide with core diameter W_2 and an index of refraction n_2 butt coupled to said end region of said planar optic waveguide in a manner so that its axis forms an angle θ_2, other than zero, with a perpendicular to said end region such that light energy propagating in said fiber optic waveguide is coupled to said planar optic waveguide within a region W_1 thereby accomplishing a magnification M_W for the width of the light energy that is given by

$$M_W = W_1/W_2 = \cos\theta_1/\cos\theta_2$$

and a divergence magnification M_D that is given by

$$M_D = (n_2/n_1)\,(1/M_W)$$

where θ_1 is the angle made by the propagation path, in said planar optic waveguide with said perpendicular to said end region and is determined from

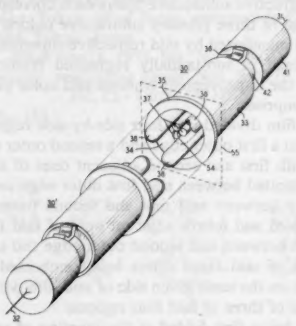
$$n_1 \sin\theta_1 = n_2 \sin\theta_2$$

4,094,580

HERMAPHRODITE OPTICAL FIBER CONNECTOR

John Stone Cook, Rumson, and Carl Ragnar Sandahl, Morristown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1976, Ser. No. 754,602
Int. Cl.² G02B 5/14
U.S. Cl. 350—96.21 **2 Claims**



1. A hermaphrodite optical fiber connector comprising:

a first housing having a cylindrical opening extending axially therethrough,

a connector body disposed within said first housing and having an end portion with three equally circumferentially spaced radially extending slots therein,

a second portion of said connector body adjacent to said end portion having an aperture running axially therethrough and being of substantially triangular cross section,

a third portion of said connector body adjacent said second portion having an axially aligned aperture with a truncated conical cross section,

three substantially identical cylindrical inner rods partly disposed within the triangular cross sectioned aperture, said inner rods being thereby held in tangential contact with each other so that they form a holding channel,

an optical fiber disposed within the holding channel formed by the inner rods, the end of the fiber and ends of said inner rods terminating in a planar surface substantially perpendicular to the longitudinal axis of the fiber,

three substantially identical cylindrical outer rods interference fitted in said connector body slots with the ends of said outer rods extending beyond said planar surface to protect the end of the fiber, the diameter of said outer rods being substantially greater than the diameter of said inner rods, the ends of said outer rods being hemispherically shaped;

a duplicate housing having a cylindrical opening extending axially therethrough;

a duplicate connector body disposed within said duplicate housing and having an end portion with three equally circumferentially spaced radially extending slots therein,

a second portion of said duplicate connector body adjacent to the end portion thereof having an aperture running axially therethrough and being of substantially triangular cross section,

a third portion of said duplicate connector body adjacent the second portion thereof having an axially aligned aperture with a truncated conical cross section,

three substantially identical cylindrical inner rods partly disposed within the triangular cross sectioned aperture in said duplicate connector body, said inner rods being thereby held in tangential contact with each other so that they form a holding channel,

an optical fiber disposed within the holding channel formed by the latter inner rods, the end of the fiber and ends of the latter inner rods terminating in a planar surface substantially perpendicular to the longitudinal axis of the fiber,

three substantially identical cylindrical outer rods interference fitted in said duplicate connector body slots with the ends of said outer rods extending beyond said planar surface to protect the end of the fiber, the diameter of the latter outer rods being substantially greater than the diameter of the latter inner rods, the ends of the latter outer rods being hemispherically shaped,

all of said outer rods being of the same diameter D_2 and all of said inner rods being of the same diameter D_1,

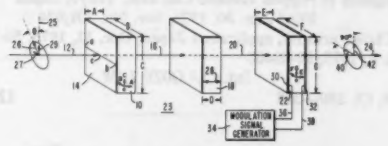
said first and duplicate housings being mated by slidably engaging each of said plurality of outer rods so that the interdigitated tangentially contacting outer rods form a six-sided nest containing each of the plurality of inner rods.

4,094,581

ELECTRO-OPTIC MODULATOR WITH COMPENSATION OF THERMALLY INDUCED BIREFRINGENCE

Gary D. Baldwin, Columbia, and Stephen J. Bepko, Cockeysville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 31, 1977, Ser. No. 763,764
Int. Cl.² G02F 1/03
U.S. Cl. 350—150 **14 Claims**



1. A method for modulating radiation which includes compensation for thermally induced birefringence comprising the steps of:

passing monochromatic radiation through a first electro-optic crystal having a predetermined crystalline structure and chemical composition,

passing radiation exiting from said first electro-optic crystal through an optical compensating element having rotatory power,

passing radiation exiting from said optical compensating element through a second electro-optic crystal having a prdetermined crystalline structure and chemical composition,

generating a modulation signal, and

generating an electric field across said second crystal in response to said modulation signal.

4,094,582

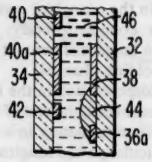
LIQUID CRYSTAL MATRIX DISPLAY DEVICE WITH TRANSISTORS

Lawrence Alan Goodman, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,168

Int. Cl.² G02F *1/16*; G08B *23/00*; H03K *17/60*; H01L *29/78*

U.S. Cl. 350—333 **7 Claims**



1. A liquid crystal display device comprising

a first set of a plurality of elongated, spaced, parallel electrodes,

a second set of a plurality of spaced electrodes coplanar with said first set of electrodes,

a third set of a plurality of elongated, spaced parallel electrodes in a plane spaced from that of the first and second electrodes, the third set of electrodes extending substantially perpendicular to said first set of electrodes, with each of said third electrodes being opposite to at least one of the second electrodes,

a liquid crystal material between the second set of electrodes and the third set of electrodes, and

semiconducting material extending between and contacting each of the second electrodes and a first electrode and wherein the liquid crystal material extends across and contacts the semiconductor material forming a transistor.

4,094,583

ACOUSTOOPTIC DEVICE

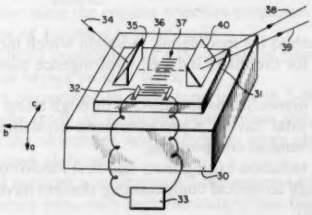
Yojiro Kondo, and Yoshinori Ohta, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1976, Ser. No. 701,024

Claims priority, application Japan, Dec. 11, 1975, 50-147982; Jul. 4, 1975, 50-82480

Int. Cl.² G02F *1/28*

U.S. Cl. 350—358 **12 Claims**



1. In an acoustooptic device, an acoustooptic medium consisting essentially of a single crystal of $PbO \cdot xNb_2O_5$ in which the mol composition of Nb_2O_5 in said crystal is $1.5 \leqq x \leqq 3.1$.

4,094,584

FORMAT FOR COLOR DIFFRACTIVE SUBTRACTIVE FILTERS

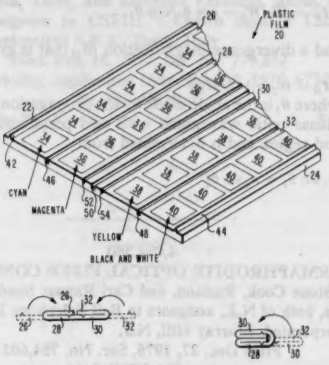
William James Hannan, Concord, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 14, 1977, Ser. No. 787,702

Claims priority, application United Kingdom, Sep. 28, 1976, 40134/76

Int. Cl.² G02B *5/18*; G03C *1/76*

U.S. Cl. 350—162 SF **5 Claims**



1. In a color-picture transparency comprised of three superimposed diffractive subtractive filters each corresponding to a different one of three primary subtractive colors, the picture information manifested by said respective superimposed filters being disposed in substantially registered relationship with each other, the improvement wherein said color picture transparency comprises:

a plastic film divided into four side-by-side regions situated between a first outer edge and a second outer edge of said film with first and second adjacent ones of said four regions located between said first outer edge and a midline halfway between said first and second outer edges and with third and fourth adjacent ones of said four regions located between said second outer edge and said midline;

each one of said three filters being embossed as a relief pattern on the same given side of said film within a different one of three of said four regions;

said film being first folded at the junction of said first and second regions to provide that said first outer edge substantially coincides with said midline and said given side of said first region is in face-to-face relationship with said given side of said second region;

said film being second folded at the junction of said third and fourth regions to provide that said second outer edge substantially coincides with said midline and said given side of said third region is in face-to-face relationship with said given side of said fourth region, and

said film being third folded at said midline to provide that said outer edges are within the interior thereof and that all three of said filters are superimposed and are substantially in registration with each other.

4,094,585

LOUPE

Ellis I. Betensky, Toronto, Canada, assignor to Opcon Associates of Canada, Ltd., Toronto, Canada

Filed Sep. 17, 1976, Ser. No. 724,323

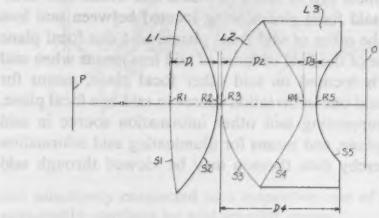
Int. Cl.² G02B *9/10, 25/00*

U.S. Cl. 350—175 E **16 Claims**

1. A magnifier comprising from the viewing end, a first positive lens group comprising a singlet element, a second lens group comprising a bi-convex element and a bi-concave element forming a doublet having the overall shape of a meniscus,

said elements having surfaces S1–S5 with curvatures C1–C5 numbered successively from the viewing end where the curvature is the equivalent focal length of the lens, divided by the surface radius at the optical axis, and

$0.2 < C1 < 0.75$



$1.0 < C2 < 1.7$

$1.2 < C3 < 1.9$

$1.0 < C4 < 5.0$

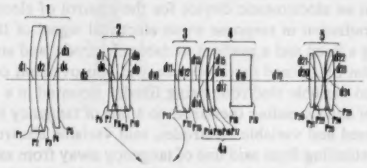
$1.5 < C5 < 3.5$.

4,094,586

COMPACT ZOOM LENS

Yasuhisa Sato, Kawasaki; Sadahiko Tsuji, Yokohama, and Katsumi Tanaka, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 1, 1976, Ser. No. 736,941
Claims priority, application Japan, Nov. 5, 1975, 50-133320
Int. Cl.² G02B *15/18*
U.S. Cl. 350—184 **10 Claims**



1. A compact zoom lens comprising:

a first lens group which has a positive refractive power and consists of a positive lens formed by joining a negative lens and a positive lens together and a positive meniscus lens, the first lens group being movable for focusing;

a second lens group which has a negative refractive power and is disposed in the rear of the first lens group on the axis thereof, the second lens group consisting of a negative lens and another negative lens formed by joining a negative lens and a positive lens together, the second lens group being movable for variation;

a third lens group which has a positive refractive power and is disposed in the rear of the second group on the axis thereof, the third group consisting of a positive lens formed by joining a negative lens and a positive lens together, the third lens group being movable for compensation concurrently with the second lens group, the locus of the movement of the third group being in a concave shape as viewed from the side of an photographing object; and

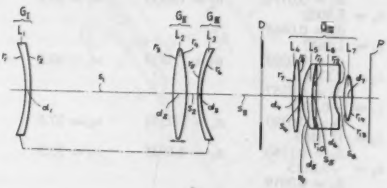
an image forming lens group which has a positive refractive power and is disposed in the rear of the third lens group on the axis thereof, the image forming lens group consisting of a front sub-group and a rear sub-group, the front sub-group having a positive refractive power and being composed of two positive lenses each having a convex face on the object side and a negative lens being disposed apart from these two lenses on their axis, the rear sub-group being composed of a positive lens, a negative lens having a concave face on the object side; and a positive lens having a convex face on the object side.

4,094,587

AFOCAL FRONT ATTACHMENT FOR ZOOM OBJECTIVE

Walter Besenmatter, and Trude Muszumanski, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Aug. 10, 1976, Ser. No. 713,222
Claims priority, application Austria, Aug. 11, 1975, 6231/75
Int. Cl.² G02B *15/10*
U.S. Cl. 350—184 **7 Claims**



1. A substantially afocal front attachment of variable magnification ratio for an optical objective, consisting of a first, a second and a third lens member axially spaced from one another, said first and third lens members being negatively refracting and rigidly interconnected, said second lens member being positively refracting and axially movable with reference to said first and third lens members;

said first lens member L_1, said second lens member L_2 and said third lens member L_3 having radii of curvature $r_1 - r_6$, thicknesses $d_1 - d_3$, axial separations $s_1 - s_2$, refractive indices n_d and Abbe numbers ν_d substantially as given in the following table:

			n_d	ν_d
L_1	$r_1 = -2.6$	$d_1 = 0.1$	1.53	48
	$r_2 = -10.3$	$s_1 = 2.9 - 0.2$		
L_2	$r_3 = +5.2$	$d_2 = 0.3$	1.64	60
	$r_4 = -5.2$	$s_2 = 0.2 - 2.9$		
L_3	$r_5 = +3.3$	$d_3 = 0.1$	1.62	58
	$r_6 = +1.9$			

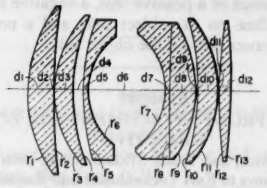
4,094,588

LARGE-APERTURE PHOTOGRAPHIC LENS SYSTEM

Jihei Nakagawa, Higashimurayama, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jun. 10, 1976, Ser. No. 694,644
Claims priority, application Japan, Jun. 14, 1975, 50-72257
Int. Cl.² G02B *9/62*
U.S. Cl. 350—215 **2 Claims**

1. A large-aperture photographic lens system comprising a first positive meniscus lens component, a second positive meniscus lens component, a third negative meniscus lens component, a fourth negative cemented meniscus doublet lens component, a fifth positive meniscus lens component and a sixth positive lens component, in which said large-aperture photographic lens system has the following numerical data:



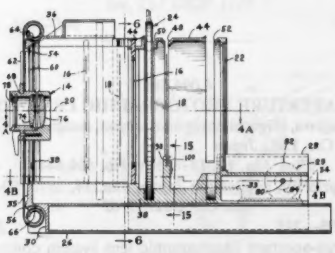
$r_1 = 0.6147$			
$d_1 = 0.1158$	$n_1 = 1.6204$	$\nu_1 = 60.3$	
$r_2 = 2.9052$			
$d_2 = 0.0019$			
$r_3 = 0.4738$			
$d_3 = 0.0777$	$n_2 = 1.6935$	$\nu_2 = 50.8$	
$r_4 = 0.8002$			
$d_4 = 0.0468$			
$r_5 = 1.0617$			
$d_5 = 0.0203$	$n_3 = 1.5814$	$\nu_3 = 40.8$	
$r_6 = 0.2764$			
$d_6 = 0.3357$			
$r_7 = -0.2984$			
$d_7 = 0.0193$	$n_4 = 1.7552$	$\nu_4 = 27.5$	
$r_8 = 15.8469$			
$d_8 = 0.1160$	$n_5 = 1.6935$	$\nu_5 = 53.3$	
$r_9 = -0.5113$			
$d_9 = 0.0019$			
$r_{10} = -1.0617$			
$d_{10} = 0.0890$	$n_6 = 1.8061$	$\nu_6 = 40.9$	
$r_{11} = -0.4676$			
$d_{11} = 0.0023$			
$r_{12} = 1.8784$			
$d_{12} = 0.0570$	$n_7 = 1.6935$	$\nu_7 = 50.8$	
$r_{13} = -2.2973$			
$f = 1.0$	$f_B = 0.7430$		

wherein reference symbols r_1, r_2, . . . r_{13} respectively represent radii of curvature of respective surfaces of respective lenses, reference symbols d_1, d_2, . . . d_{12} respectively represent thicknesses of respective lenses and airspaces between respective lenses, reference symbols n_1, n_2, . . . n_7 respectively represent refractive indices of respective lenses, reference symbols ν_1, ν_2, . . . ν_7 respectively represent Abbe's numbers of respective lenses, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_B represents the back focal length of the lens system.

4,094,589
DATA VIEWER

George J. Brown, 22 Grandview Ave., Waterbury, Conn. 06708

Filed Mar. 29, 1976, Ser. No. 671,109
Int. Cl.² G09F *11/24*; G02B *27/02*; G03B *21/00*
U.S. Cl. 350—241 26 Claims

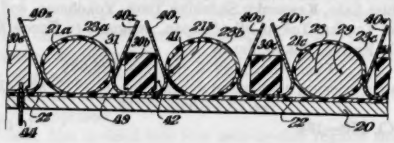


1. The combination comprising a viewer and at least two translucent information sources for positioning in said viewer, each of said information sources having data imprinted thereon and related to data imprinted on the other of said information sources, at least one of said information sources comprising a transparency, one of said information sources having data imprinted thereon in one translucent color and another of said information sources having information imprinted thereon in another translucent color, said one color and said other color being additive colors, said viewer having a housing, lens means supported on said housing, means for selective focusing said lens means on each of at least two focal planes located serially along the optical axis of said lens means and within said housing, one of said focal planes being located between said lens means and the other of said focal planes, said one focal plane being outside of the field of focus of said lens means when said lens means is focused on said other focal plane, means for supporting said one information source in said one focal plane, means for supporting said other information source in said other focal plane, and means for illuminating said information sources whereby data thereon may be viewed through said lens means.

4,094,590
ELECTROSTATIC DEVICE FOR GATING ELECTROMAGNETIC RADIATION

Charles G. Kalt, Williamstown, Mass., assignor to Dielectric Systems International, Inc., Williamstown, Mass.

Filed Aug. 4, 1976, Ser. No. 711,610
Int. Cl.² G02F *1/16*
U.S. Cl. 350—269 10 Claims



1. In an electrostatic device for the control of electromagnetic radiation in response to an electrical signal of the class having a fixed and a resilient variable electrode, and an insulative film interposed therebetween, the improvement comprising said variable electrode being fixedly mounted in a portion thereof and extending therefrom to a line of tangency between said fixed and variable electrodes, said variable electrode further extending from said line of tangency away from said fixed electrode, said variable electrode having a bend in the region between said mounting and said line of tangency, said bend being convex toward said fixed electrode.

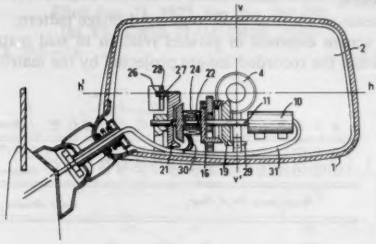
4,094,591
ELECTRIC DEVICE CONTROLLING THE MOVEMENT OF THE MIRROR IN AN EXTERNAL REARVIEW MIRROR UNIT

Raymond Lafont, Paris, France, assignor to B.S.G. International Limited, Birmingham, England

Filed Jun. 25, 1976, Ser. No. 699,851
Claims priority, application France, Jun. 27, 1975, 75 20407
Int. Cl.² G02B *5/08*
U.S. Cl. 350—289 10 Claims

1. A rear-view mirror assembly comprising a housing, a reflective surface mounted in said housing for movement on first and second axes of rotation, said first axis of rotation being different to said second axis of rotation, an electrical motor, rotary drive means including a reduction gear coupled to said electrical motor, first and second driven means for rotating said reflective surface on said first and second axes of rotation respectively and selector means for selectively coupling said reduction gear to said first and second driven means, said first and second driven means each comprising a clutch having first

and second engageable members, each of said first engageable members being constantly connected to said reduction gear



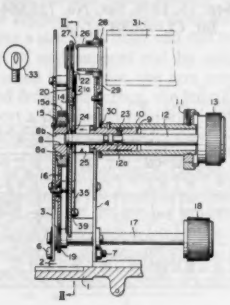
and selectively connected to a respective one of said second engageable members by said selector means.

4,094,592

OPHTHALMIC EXAMINATION CHART PROJECTOR

Mitsugu Aoki, Tokyo, and Taketoshi Ishihara, Soka, both of Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1977, Ser. No. 762,338
Claims priority, application Japan, Feb. 3, 1976, 51-11220[U]
Int. Cl.[2] A61B *3/02*
U.S. Cl. 351—30 6 Claims



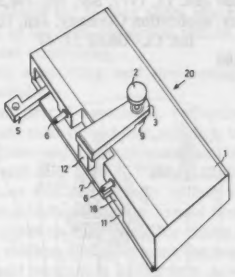
1. Ophthalmic examination chart projector comprising a circular chart carrying disc having a plurality of ophthalmic examination charts disposed along a peripheral portion of the disc, a circular mask plate having a plurality of openings which are peripherally spaced apart from each other, means for supporting said chart carrying disc and the mask plate co-axially and rotatably about a horizontal axis, illumination light source means provided at one side of the chart carrying disc and the mask plate, projection lens means provided at the other side of the chart carrying disc and the mask plate so as to define together with the light source means a projecting optical path which pass through the peripheral portion of the disc, one of said chart carrying disc and said mask plate being in engagement with a first operating member extending co-axially from said one of the chart carrying disc and the mask plate so that it is rotated by the first operating member, the other of the chart carrying disc and the mask plate being in engagement with a second operating member which is located outside the periphery of said other of the disc and the plate and extending in parallel with and in the same direction as the first operating member, whereby one of the charts on the disc and one of the openings in the mask plate can be positioned in the optical path through actuation of the first and the second operating members, said projector further including astigmatic index means comprising a rotatable member positioned in said optical path and having an index, and a third operating member extending in the same direction as the first and second operating members and in engagement with said rotatable member for rotating it to circumferentially move said index.

4,094,593

INSTRUMENT BASE FOR OPHTHALMOLOGICAL INSTRUMENTS

Andreas Kutscherauer, Oberkochen, and Ortwin Müller, Konigsbronn, both of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Germany

Filed Sep. 1, 1976, Ser. No. 719,811
Claims priority, application Germany, Sep. 16, 1975, 7529211
Int. Cl.[2] A61B *3/00*
U.S. Cl. 351—38 5 Claims



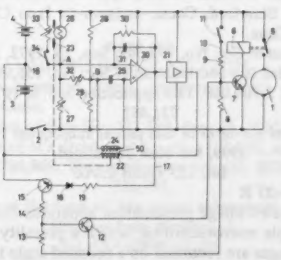
1. An instrument base for ophthalmological instruments comprising a hollow housing having an upper surface which serves as a table, said housing having means defining an opening in one side thereof, a guide plate within said housing and therefore beneath said table, at least a portion of said guide plate extending to the outside through the opening, means located within said housing for supporting said guide plate for movement along coordinate axes x-y, and a control arm connected to said guide plate and extending across a relatively small area of the upper surface of said table.

4,094,594

MOVIE-CAMERA WITH AUTOMATIC FADE-OUT SHUTOFF

Hermann Mayer, Esslingen, and Hans-Friedrich Kiefer, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 12, 1976, Ser. No. 675,808
Claims priority, application Germany, Apr. 25, 1975, 2518369
Int. Cl.[2] G03B *21/36*
U.S. Cl. 352—91 C 10 Claims



1. A movie camera comprising: a film-advance motor; a source of electricity; switch means between said source and said motor closable for connecting same together to operate said motor and openable for disconnecting same to stop said motor; a diaphragm having an aperture of variable size; fade means connected to said diaphragm for slowly closing same for

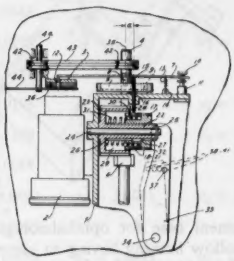
fade out and for slowly opening same for fade in; and circuit means connected between said fade means and said switch means for detecting the aperture size and opening said switch means when said aperture being closed after fade out, wherein said fade means includes a driving coil connected to said diaphragm for opening and closing same, said circuit means including a damping coil adjacent said drive coil and capable of generating a voltage.

4,094,595

CONTROL MECHANISM FOR THE PULL-DOWN PAWL OF A FILM PROJECTOR

Hans Lieckfeldt, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Jan. 11, 1977, Ser. No. 758,544
Claims priority, application Germany, Jan. 16, 1976, 2601503
Int. Cl.[2] G03B *21/48*
U.S. Cl. 352—180 **12 Claims**



1. In a control mechanism for the pull-down pawl means of a projector for the projection of films with different film frequencies, a combination comprising support means; a drive wheel mounted on said support means for rotation about its axis; a control drum coaxial with said drive wheel and arranged for controlling the movement of one end of the pull-down pawl means into and out of perforations in a film to be projected; a plurality of different cam curves extending axially displaced from each other about the periphery of said control drum; and means connecting said control drum with said drive wheel for rotation with the latter and movable in axial direction relative thereto, said drive wheel being formed with a recess extending in the direction of said axis and dimensioned so that said control drum may be moved in axial direction into and out of said recess.

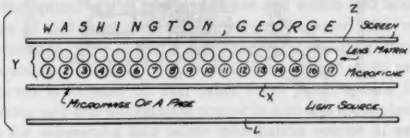
4,094,596

ANIMATED IMAGE PRESENTATION APPARATUS

Adnan Waly, Stamford, Conn., assignor to Izon Corporation, Stamford, Conn.

Continuation of Ser. No. 291,589, Sep. 25, 1972, Pat. No. 4,033,686, which is a continuation of Ser. No. 135,996, Apr. 21, 1971, Pat. No. 3,704,068. This application Sep. 8, 1976, Ser. No. 721,451
The portion of the term of this patent subsequent to Nov. 28, 1989, has been disclaimed.
Int. Cl.[2] G03B *23/08*
U.S. Cl. 353—27 R **3 Claims**

1. An animated image presentation apparatus comprising:
A. a multiple microrecord on which a plurality of interrelated images are recorded on a reduced scale in a manner in which each image thereof is dissected into a multiplicity of bits which are dispersed to form an image pattern that is distinct from and interlaced with the image patterns defined by the recordings of the other images;
B. means to support said microrecord in a plane;
C. a lens matrix disposed in parallel relation to said microrecord to project an image pattern in registration therewith, said matrix being constituted by an array of lensettes that are dispersed on the matrix to assume positions that are optically aligned with the bits in the image pattern;
D. means to illuminate the registered image pattern;
E. a screen disposed in parallel relation to said matrix to present the recorded images projected by the matrix; and



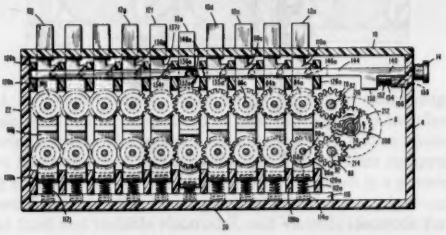
F. means to index the microrecord relative to the matrix to successively register in a predetermined sequence the image patterns recorded on the microrecord with the array of lensettes for presentation on said screen and at a rate providing an animated display.

4,094,597

METHOD AND APPARATUS FOR PRODUCING COMPOSITE FILM IMAGES FOR IDENTIFICATION

Don L. Cloud, Springfield, Mo., assignor to I.I.C., Inc., Springfield, Mo.

Filed Sep. 15, 1976, Ser. No. 723,664
Int. Cl.[2] G03B *21/26*
U.S. Cl. 353—35 **24 Claims**



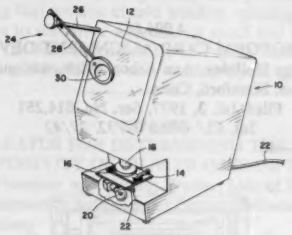
1. A viewing device for illuminating and positioning a plurality of superimposed film images comprising
a housing having at one end a viewing lens,
a light source within said housing spaced from said viewing lens,
a plurality of spaced roller pairs positioned about said light source, comprising a series of first rollers and a corresponding series of oppositely spaced second rollers,
a plurality of indicia-bearing roll films each film being secured at one end to a roller of said roller pairs,
guide means to direct each film from one of said first rollers past said light source and onto a corresponding second roller of said roller pair,
means to maintain said plurality of films between said viewing lens and said light source is approximately the same focal plane, and
film positioning control means for winding each of said films independently back and forth between its respective pair of spaced rollers without binding the film comprising
only one rotatably external control knob,
an associated internal drive means driven by said external control knob, and
only one external engaging element for each roller pair to engage both rollers of the roller pair with said drive means.

4,094,598

MICRO DISPLAY WITH MAGNIFIER

Dewey W. Hodges, 1502 S. Boulder, Tulsa, Okla. 74119

Filed Jan. 21, 1977, Ser. No. 761,237
Int. Cl.² G03B *21/14*; G02B *27/02*
U.S. Cl. 353—76 **2 Claims**



1. An improved apparatus for displaying a magnified image comprising:

a console having a rear lighted projection screen, a light source, a specimen holder, and a lens system for displaying a magnified image of the specimen on the rear surface of the projection screen, the screen being mounted for easy view of the user;

a support rod slidably and rotatably extending from said console perpendicular to said screen and adjacent one edge of said screen, the length of the support rod extending from said console being slidably variable, the outer end of the support rod having threaded means;

an arm having a slot at its inner end and being affixed to the outer end of said support rod by said threaded means being received in the slot, the arm extending parallel to and spaced from said screen, the length of said arm from said support rod being varible by reason of the threaded means being slidabe in the slot; and

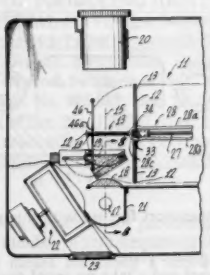
a magnifying glass pivotally supported at one edge to the outer end of said arm by a pin extending perpendicular the plane of said screen, the magnifying glass being supported parallel said console screen and movable over at least a substantial portion of said screen and variably spaced from said screen by the sliding action of said support rod to permit focusing on said screen.

4,094,599

FLEXIBLE MAGAZINE SLIDE PROJECTOR WITH MOVABLE LENS

Gerald J. Frey, 1486 Cantera Ave., Santa Barbara, Calif. 93110

Filed Aug. 22, 1977, Ser. No. 826,550
Int. Cl.² G03B *1/48, 21/20, 23/08*
U.S. Cl. 353—96 **18 Claims**



1. In a slide projector having:

an optical system including an optical axis, a slide-projection station along said axis in a plane substantially perpendicular to the axis, and a condensing lens along said axis closely adjacent to one side thereof, for directing light from a light source through a slide positioned in said station,

means supporting a series of slides in said projector for movement along an endless, closed-loop path including two substantially straight side sections and two arcuate connecting sections at the opposite ends of said side sections, one of said end sections being located alongside said slide-projection station for swinging of slides along an arcuate path into and out of the slide-projection station, through arcs of approximately ninety degrees and generally about an axis defined by said one arcuate section, said lens having an inner side adjacent said one arcuate section, an outer side remote from said one arcuate section, and upper and lower sides,

and actuating means for feeding slides along said path and into and out of the slide-projection station,

the improvement comprising:

means movably supporting said condensing lens on said projector including:

first and second tracks associated, respectively, with the outer and inner sides of said lens, said first track extending outwardly from said outer side substantially parallel to said plane, and said second track extending outwardly from said inner side substantially radially of said arcuate path and being inclined relative to said first track,

and follower means on said frame for riding on said tracks and guiding the lens for movement thereon to swing the lens about said outer side as the lens moves along said tracks;

lens-moving means for shifting the lens back and forth along said tracks in timed relation with the feeding of slides along said track by said actuating means, between the normal position in which said lens is closely adjacent the slide-projection station and a retracted position spaced outwardly from said normal position away from said one arcuate section and out of the slide path, including:

a rotary crank mechanism having a lateral throw of preselected length during each revolution,

a connecting rod connected at one end to said crank mechanism and at the other end to said lens, adjacent said outer side, to shift said outer side back and forth along said first track between said positions during each revolution,

a spring-loaded lost-motion connection between said crank mechanism and said lens,

and means for stopping outward movement of said lens at said retracted position before the lateral throw of the crank mechanism is complete, thereby to hold the lens stationary in the retracted position during a portion of each revolution,

and means driving said crank mechanism with said actuating means to produce one revolution of the crank mechanism during each slide change.

4,094,600

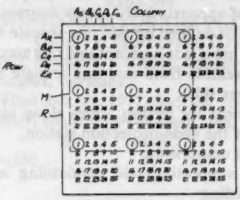
MICRO-IMAGE RECORDS

Adnan Waly, Stamford, Conn., assignor to Izon Corporation, Stamford, Conn.

Continuation of Ser. No. 291,589, Sep. 25, 1972, Pat. No. 4,033,686, which is a division of Ser. No. 135,996, Apr. 21, 1971, Pat. No. 3,704,068. This application Sep. 23, 1976, Ser. No. 725,797
The portion of the term of this patent subsequent to Nov. 28, 1989, has been disclaimed.
Int. Cl.² G03B *21/00*
U.S. Cl. 353—120 **2 Claims**

1. In combination with a lens matrix provided with a multiplicity of like lensettes in a planar array having parallel optical axes normal to the plane of said matrix, each lensette having a narrow angle of field, a microrecord in which a plurality of pages are recorded in a reduced scale, said microrecord comprising a planar record medium in parallel relation to said matrix and in close proximity thereto and a plurality of data

sets formed on said medium, each of which is separately readable, each data set formed on said medium representing a reduced scale image of a distinct page having alphanumeric or other intelligence printed thereon and being dissected into a multiplicity of data sub-sets equal in number to the number of lensettes in said array, all of which sub-sets are generated along corresponding optical axes which are parallel to each other and are normal to the medium, each sub-set constituting a minute portion of the intelligence printed on said page, the



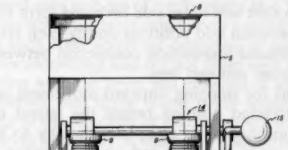
sub-sets which together form a data set being dispersed on said medium according to a predetermined pattern, the dispersed sub-sets forming the plurality of data sets being interlaced with each other whereby the multiplicity of data sub-sets constituting each data set occupies a distinct position on said medium and is projected for reading when the parallel axes of the data set selected for reading are coincident with the parallel axes of the array of lensettes and each of the sub-sets in the selected data set lies within the field of a respective lensette in the array.

4,094,601

REPRODUCTION OF PAGED MATERIAL FROM MICROFORM CARDS

Robert George Holliday, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 8, 1977, Ser. No. 814,250
Int. Cl.² G03B *27/32, 27/52, 27/42*
U.S. Cl. 355—26 **2 Claims**



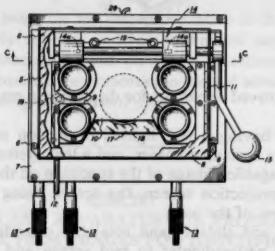
1. A process for reproducing paged material from microform cards, comprising:
(a) photographing a first sequence of paged material to produce a first microform card containing at least some of the pages in said first sequence;
(b) photographing a second sequence of paged material, corresponding to the respective reverse sides of said first sequence of pages, to produce a second microform card containing at least some of the pages in said second sequence;
(c) aligning each microform card thus produced with a spatially-defined test pattern;
(d) while the card is thus aligned, perforating the card;
(e) placing the perforated card in a microfiche holder of an office-type microprint copier, the holder having at least one raised pin per card perforation for securing the card;
(f) using said copier, reproducing enlarged copies of said first sequence of pages from the microform;
(g) repeating step (f) for said second sequence of pages using the reverse sides of said first sequence enlarged copies as the copy members for the second sequence of copies, such that the front and back portions of each resulting duplexed copy are sequentially-numbered pages of the paged material;
wherein the front and back portions of the copies have image areas which substantially coincide with each other.

4,094,602

MICROFORM CARD ALIGNMENT DEVICE

Robert George Holliday, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 3, 1977, Ser. No. 814,251
Int. Cl.² G03B *27/32, 27/42*
U.S. Cl. 355—40 **1 Claim**



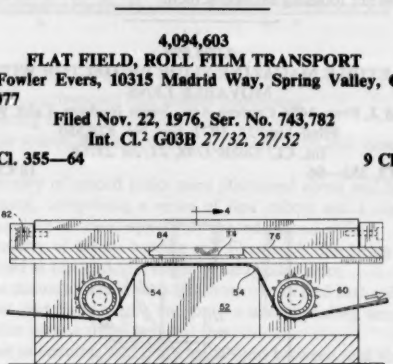
1. An apparatus for aligning a series of microform cards with a spatially-defined test pattern, comprising:
(a) a platen having at least one substantially transparent area bearing a spatially-defined test pattern;
(b) means for retaining a microform card upon said platen and said test pattern;
(c) optical means proximate said platen for projecting said test pattern and that portion of said microfiche card overlapping thereon onto a viewing surface;
(d) adjustable means in contact with said retaining means for moving said retaining means and thus said microform card relative to said platen and said test pattern; and
(e) means for perforating said microform card when said card is in contact with said retaining means.

4,094,603

FLAT FIELD, ROLL FILM TRANSPORT

Ben Fowler Evers, 10315 Madrid Way, Spring Valley, Calif. 92077

Filed Nov. 22, 1976, Ser. No. 743,782
Int. Cl.² G03B *27/32, 27/52*
U.S. Cl. 355—64 **9 Claims**



1. A roll film transport for use with a paper printer or the like, comprising:
(a) a supporting base plate;
(b) a supply spool and a take-up spool operatively mounted on said base plate;
(c) an exposure station structure between said spools and having a film track defined by a pair of narrow, co-planar, spaced rails to receive the longitudinal edge portions only of a film being processed, and having a mask operatively

positioned slightly above said rails and having a window opening between the rails and dimensioned to expose a single frame of film being processed;

(d) means to bend a film sharply downwardly at at least one end of said film track in said exposure station structure immediately outside the exposure area thereof whereby the film is flattened temporarily in a portion thereof including that portion at said window opening; and

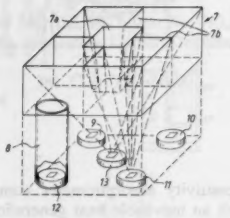
(e) means to slip drive said take-up spool and means to advance the film intermittently to expose successive frame portions of the film in said window opening.

4,094,604

APPARATUS FOR DETERMINING THE LIGHT TRANSMISSIVITY OF FILM FRAMES OR THE LIKE

Bernd Payrhammer, and Helmut Treiber, both of Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 1, 1977, Ser. No. 829,786
Claims priority, application Germany, Sep. 9, 1976, 2640681
Int. Cl.[2] G03B *27/78*
U.S. Cl. 355—68 **10 Claims**



1. Apparatus for determining the light transmissivity of film frames or other originals of the type wherein a central field is surrounded by a plurality of peripheral fields, comprising means for locating an original in a predetermined plane; means for directing light against one side of the original in said plane; a plurality of signal-generating photosensitive elements at the other side of said plane, one for each of said fields; and a diaphragm interposed between said plane and said elements, said diaphragm including means for confining light passing through the central field of the original in said plane to impinge solely upon the associated element and for confining light passing through the peripheral fields of the original in said plane to impinge solely upon the elements which are associated with the respective peripheral fields as well as upon the element which is associated with said central field.

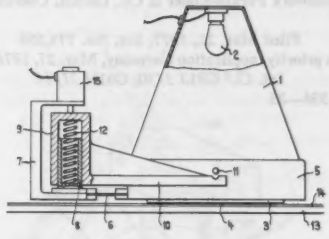
4,094,605

APPARATUS FOR PRODUCING IDENTICAL SHEETS OF MATERIAL HAVING A NUMBER OF REPRESENTATIONS THEREON

Bruno Zumbach, Orpund, Switzerland, assignor to Zumbach Electronic AG, Orpund, Switzerland

Continuation of Ser. No. 535,857, Dec. 23, 1974, abandoned, which is a division of Ser. No. 176,767, Aug. 27, 1971, Pat. No. 3,868,756. This application May 9, 1977, Ser. No. 795,169
Claims priority, application Germany, Aug. 31, 1970, 2043121
Int. Cl.[2] G03B *27/04*
U.S. Cl. 355—95 **9 Claims**

1. A photocopying apparatus for producing sheets of material each having a number of representations thereon, comprising rigid support means for fixing a sheet, a reproduction device and means for the adjustment of the reproduction device in steps for applying representations on said sheet in different places, said reproduction device having a fluoroscopy bell and lifting means for lifting it transversely off said sheet, and on the underside of which an original drawing or transparency of a representation can be fitted, said fluoroscopy bell including a source of illumination for illuminating said drawing or transparency, and the fluoroscopy bell being connected to a carriage by suspension means substantially rigid in a direction parallel to said sheet but elastic in a direction transversely to said sheet, a loose connection between a portion of said lifting means and said fluoroscopy bell allowing free alignment of the



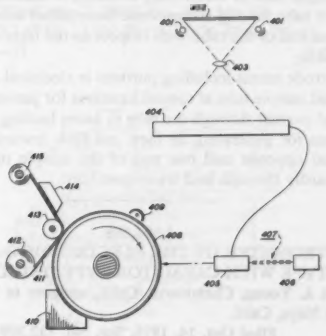
fluoroscopy bell to said sheet and support means respectively if the fluoroscopy bell rests on said sheet and support means respectively, such that the bottom portion of the fluoroscopy bell may closely be applied against said sheet disposed below it but the location of said fluoroscopy bell on said sheet being substantially rigidly determined by said suspension means.

4,094,606

XEROGRAPHIC SYSTEM EMPLOYING WAVEGUIDE ADDRESSING AND MODULATING APPARATUS

Don L. Camphausen, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 26, 1976, Ser. No. 745,276
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 R **4 Claims**



1. An imaging system for producing an image responsive to optical input from an original image, the system comprising:

(a) a light sensitive imaging surface;

(b) a plurality of individual optical waveguides having light propagating therethrough and impinging said surface, the waveguides being formed from a material which modulates the propagating light responsive to an electric field,

(c) a means to modulate the propagating light in the individual waveguides which comprises a common electrode adjacent to the waveguides, a charge-coupled device positioned to intersect the individual waveguides, the charge-coupled device including an individual electrode adjacent each waveguide opposite the common electrode, and a control means to optically scan an original and to cause the charge-coupled device to place a charge at selected ones of the individual electrodes responsive to non-image areas of the original so as to establish an elec-

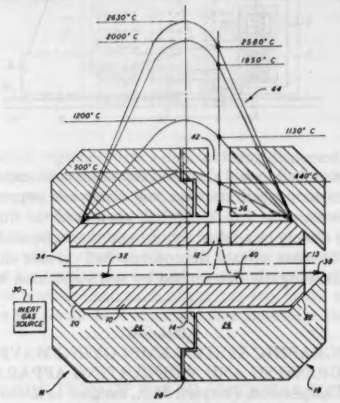
tric field between each of the selected ones of the individual electrodes and the common electrode.

4,094,607

APPARATUS FOR FLAMELESS ATOMIZATION OF A SAMPLE FOR ATOMIC ABSORPTION ANALYSIS

Rolf Gunther Arnold Tamm, Salem, Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Germany

Filed Mar. 21, 1977, Ser. No. 779,559
Claims priority, application Germany, Mar. 27, 1976, 2613196
Int. Cl.[2] G01J *3/30;* G01N *21/16*
U.S. Cl. 356—85 **6 Claims**



1. Apparatus for flamesless atomization of a sample for atomic absorption analysis comprising:

a sample tube of electrically conductive material, said sample tube having a transverse bore offset axially towards one end of the tube with respect to the transverse central plane;

electrode means including portions in electrical contact with said sample tube at spaced locations for passing an electrical current through the tube to cause heating thereof; and

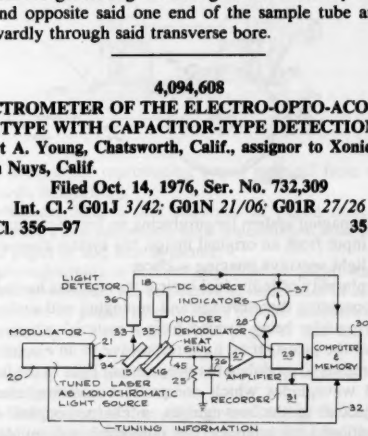
means for generating an inert gas flow inwardly from the end opposite said one end of the sample tube and outwardly through said transverse bore.

4,094,608

SPECTROMETER OF THE ELECTRO-OPTO-ACOUSTIC TYPE WITH CAPACITOR-TYPE DETECTION

Robert A. Young, Chatsworth, Calif., assignor to Xonics, Inc., Van Nuys, Calif.

Filed Oct. 14, 1976, Ser. No. 732,309
Int. Cl.[2] G01J *3/42;* G01N *21/06;* G01R *27/26*
U.S. Cl. 356—97 **35 Claims**



23. A method of analyzing a sample including the steps of:

collecting the sample in a sample carrier;

providing a conducting backing sheet for one surface of the sample carrier;

after collection of the sample providing an electrical potential on a conducting layer at the opposite surface of the sample carrier;

directing a beam of radiation onto the sample to cyclically heat the sample and vary the spacing between the electrical potential and the backing sheet; and

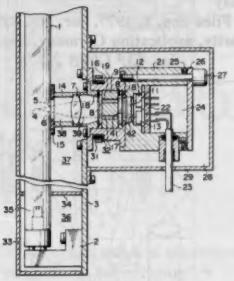
producing an ac signal varying with the variation in spacing.

4,094,609

HIGH SENSITIVITY ABSORPTIOMETER

Yoshio Fujii; Mitsuo Shimada, both of Katsuta, and Sadabumi Ohnuma, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 11, 1977, Ser. No. 767,888
Claims priority, application Japan, Feb. 19, 1976, 51-17423
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—201 **18 Claims**



1. A high sensitivity absorptiometer comprising a light source lamp with an inevitable heat generation, sample containing means through which light from said light source lamp transmits, detecting means for detecting the light transmitted through said sample accommodating means, and a chamber formed by at least a surface portion of said light source lamp and an enclosing wall member fitted tightly to said surface so that said chamber is inhibited from fluid communication with the exterior, wherein said light emitted from said light source lamp and directed to said sample containing means is caused to pass through said chamber

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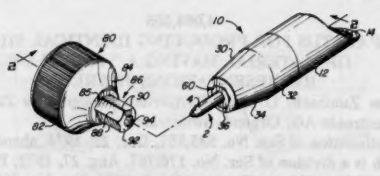
4,094,610

PEN LOCK APPARATUS

Wesley H. Larson, P.O. Box 224, Scottsdale, Ariz. 85252

Filed Feb. 3, 1977, Ser. No. 765,378
Int. Cl.[2] B43K *29/00*
U.S. Cl. 401—195 **5 Claims**



1. Pen lock apparatus, comprising in combination:

a barrel for receiving a spring biased pen cartridge, including

a first bore in the barrel in which the cartridge is disposed,

a first shoulder at one end of the barrel, and

an internally threaded portion in the first bore adjacent the shoulder;

a tip secured to the barrel, including

first bore means,

a second shoulder in the first bore means,

an externally threaded portion for matingly engaging the internally threaded portion of the first bore of the barrel, and

a third shoulder adjacent the externally threaded portion and disposed against the first shoulder of the barrel when the tip is secured to the barrel;

insert means movably disposed in the first bore means of the tip, including

a fourth shoulder disposed against the second shoulder of the first bore means of the tip,

second bore means for receiving the spring biased cartridge, including a fifth shoulder in the second bore means against which a portion of the spring biased cartridge is disposed; and

a wrench for locking and unlocking the tip from the barrel, including

a cylindrical portion for grasping by a user,

key means secured to the cylindrical portion and insertable into the first bore means of the tip to engage and disengage the threaded portions of barrel and tip, and

third bore means for receiving a portion of the pen cartridge.

4,094,611

SECURING MEANS FOR MACHINE PARTS

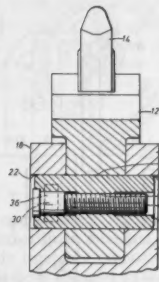
John A. Harper, High Wycombe, and Terence V. Williams, Marlow, both of England, assignors to Austin Hoy and Company, Ltd.

Filed Mar. 25, 1977, Ser. No. 781,353

Claims priority, application United Kingdom, Jan. 28, 1977, 3694/77

Int. Cl.² F16B *21/00*

U.S. Cl. 403—14 **6 Claims**



1. Means for securing together a first, U-shaped member and a second member received within the first member, comprising registering bores in the legs of the first member, a bore in the second member positionable in registration with and of equal cross section to the bores in the first member, at least one recess formed in one of said members to extend transversely from the bore therein, a cross pin having a cross section corresponding with said bores and being of a length equal to or less than the overall length of said bores in registration, the cross pin being hollow and provided on part of its internal surface with a screw thread, the cross pin also having a transverse bore extending from its internal to its external surface and adapted for positioning opposite said recess, and a locking pin in frictional force fit engagement with said transverse bore and seated below the external periphery of said cross pin and drivable along the transverse bore to extend into the recess.

4,094,612

TOOL MOUNTING APPARATUS

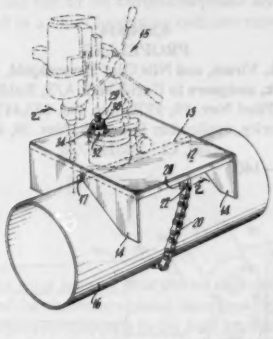
Adrian H. Krieg, Yorktown Heights, N.Y., assignor to Widder Corporation, Mamaroneck, N.Y.

Filed Jul. 29, 1976, Ser. No. 709,890

Int. Cl.² B23B *39/00, 47/00, 49/00*

U.S. Cl. 408—92 **7 Claims**

1. Apparatus for supporting a tool relative to a work piece having a curved or irregular circumferential surface, comprising a flat mounting plate having a pair of side legs respectively depending from first and second opposite sides of said plate, each of said side legs having a substantially identical V-shaped notch adapted to receive said work piece, the apex of each notch being adjacent to and positioned substantially at the center of the mounting plate, and means attaching said plate to said work piece comprising a flexible fastener, first means



attaching one end of said fastener to a third side of said plate and second means depending from a fourth side of said plate and adapted to engage the other end of said fastener, said second means including an adjustable device for pulling the said other end of said fastener toward the bottom of said plate to engage the edges of the notches into tight gripping relationship with the surface of said work piece.

4,094,613

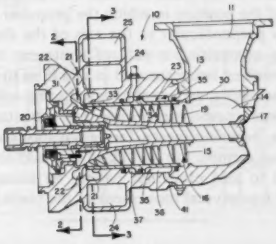
VARIABLE OUTPUT CENTRIFUGAL PUMP

Robert L. Bracken, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 7, 1976, Ser. No. 684,335

Int. Cl.² F01B *25/04;* F01D *17/08;* F04D *29/44*

U.S. Cl. 415—17 **5 Claims**



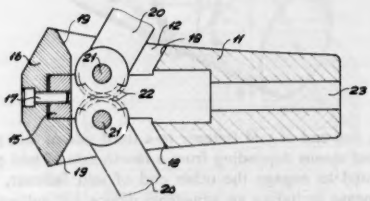
1. A centrifugal pump for receiving fluid at one flow rate and pressure head and discharging the fluid at an increased pressure head including, a housing, a shaft journaled for rotation within housing, an impeller within said housing and mounted on said shaft for rotation therewith, an inlet chamber within said housing for receiving fluid into said housing and directing said fluid to one end of said impeller, a first diffuser continuously communicating with the other end portion of said impeller to receive fluid discharged from said impeller, a second diffuser axially spaced from said first diffuser for selective separate communication with said other end portion of said impeller, said diffusers each being fixed to handle fluid at a specific flow rate for producing a specific pressure head, an outlet passageway between said impeller and said second diffuser, a moveable member telescoped into said housing for movement between an extended position closing off said pas-

sageway and a retracted position permitting fluid to flow from said impeller into said second diffuser, and means for biasing said member toward one of its positions including a pressure chamber communicating with said member, means for selectively pressurizing said chamber for moving said member toward said one position, said means for selectively pressurizing including a passage communicating with one of said inlet chamber and said fluid discharged from said chamber.

4,094,614
PROPELLER

Torben Munk, Virum, and Nils Oluf Ehrenskjold, Kolding, both of Denmark, assignors to Gori-Vaerk A/S, Kolding, Denmark

Filed Nov. 19, 1975, Ser. No. 633,417
Claims priority, application Denmark, Nov. 20, 1974, 6023/74
Int. Cl.[2] B63H *1/20*
U.S. Cl. 416—140 **2 Claims**



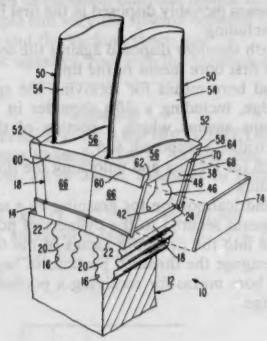
1. A propeller such as a ship's propeller or screw and comprising at least one propeller blade, a propeller drive shaft, means for mounting said propeller blade on the propeller drive shaft comprising a hub having a free end secured on the propeller drive shaft, said hub being provided with a central bore in the free end thereof, means defining a pivot axis mounted within said hub and perpendicular to the axis of the drive shaft comprising a pivot shaft, means pivotally mounting said blade about the inner end of the blade freely about the pivot shaft, said pivot shaft intersecting the longitudinal direction of the blade, abutment means for the blade for limiting the free pivotal movement of the blade between two extreme positions at either side of the position in which the propeller blade extends substantially perpendicular to the axis of the shaft, said abutment means comprising a pair of abutment members, said abutment members being secured in said bore to serve as abutments for the blades, and means for adjusting one of said abutment members comprising a clasp nut mounted within said central bore, securing means for removably securing one of said abutment members to said clasp nut, said abutment member secured to said clasp nut having an abutment face for limiting the free pivotal movement of the blade.

4,094,615
BLADE ATTACHMENT STRUCTURE FOR GAS TURBINE ROTOR

Robert G. Glenn, Huntington Valley, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 27, 1976, Ser. No. 754,725
Int. Cl.[2] F01D *5/30*
U.S. Cl. 416—215 **10 Claims**

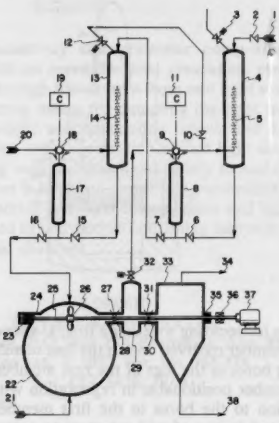
1. In a turbine rotor: a rotor disk having an outer periphery provided with a number of spaced, axially extending grooves; a plurality of ceramic turbine blades spaced outwardly from said outer periphery; and an attachment piece for each blade, respectively, each attachment piece having a root received within a respective groove of the rotor disk, each attachment piece extending outwardly from said outer periphery for coupling the blades thereto, and having an outer peripheral groove extending transversely to the corresponding groove of the rotor disk, each blade having a root received within the outer peripheral groove of the corresponding attachment piece, each pair of adjacent attachment pieces being in substantial abutment with each other to prevent gases in the vicinity of said blades from contacting the rotor disk.



4,094,616
STEAM-HEATER-PUMP

Hyok Sang Lew, 7890 Oak St., Arvada, Colo. 80005

Filed Jan. 27, 1977, Ser. No. 763,029
Int. Cl.[2] F04F *1/10, 1/12, 1/14, 1/18*
U.S. Cl. 417—121 **5 Claims**



1. A device which heats and pumps a liquid or slurry, said device comprising:

a. an uprightly disposed pumping cylinder,

b. a heating tower disposed at a higher elevation than said pumping cylinder, said heating tower including, a cylindrical container and conduits for injecting and distributing pressurized steam into a liquid or slurry contained in said cylindrical container,

c. a first pipe originating from the bottom of said heating tower and terminating at the bottom of said pumping cylinder, said first pipe having a check valve; whereby, a liquid or slurry in said heating tower may flow into said pumping cylinder, but not in reverse direction,

d. a second pipe with a check valve originating from the bottom of said pumping cylinder, whereby, a liquid or slurry in said pumping cylinder may be pushed out through said second pipe, but prohibited to flow back into said pumping cylinder,

e. a three port valve with first port connected to a pressurized steam supply line, second port connected to the top of

said pumping cylinder and third port connected to said conduits for injecting and distributing steam into said cylindrical container of said heating tower, and

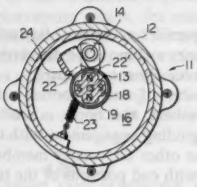
f. a valve controller operating said three port valve in such a way that said third port becomes shut when said first port is open to said second port, and said first port becomes shut when said second port is open to said third port; whereby, firstly the pressurized steam directed into said pumping cylinder pumps out a liquid or slurry in pumping cylinder through said second pipe and secondly, when the steam directed into said pumping cylinder is bled into said heating tower, a liquid or slurry in said heating tower heated by condensing steam flows into said pumping cylinder by the gravity force, said heating tower becomes refilled with a fresh liquid or slurry when the steam pressure in said heating tower vanishes as the result of condensation during the period of pumping of the liquid or slurry out of said pumping cylinder by said steam injection.

4,094,617

AUTOMOTIVE AIR CONDITIONER COMPRESSOR

Tsunenori Shibuya, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,203
Claims priority, application Japan, Nov. 10, 1975, 50/152645
Int. Cl.[2] F04R *49/00*; F25B *27/00*
U.S. Cl. 417—295 **9 Claims**



1. A compressor comprising:

a housing provided with an inlet and an outlet;

a rotor operatively rotatably supported within the housing to displace fluid from the inlet to the outlet upon rotation thereof; and

variable occluder means connected to the rotor and operative to occlude the inlet to an extent corresponding to a rotational speed of the rotor, said occluder means comprising a drive member fixed to the rotor, a driven member yieldably connected to the drive member, biasing means urging the driven member in a direction opposite to a direction of rotation of the rotor and an occluder member fixed to the driven member and movable thereby into variable occluding relation with the inlet.

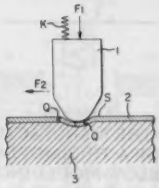
4,094,618

ROTARY PISTON ENGINES

Kuniaki Kakui, Hiroshima; Toshihiko Shigeta, and Koso Koike, both of Kure, all of Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Mar. 30, 1977, Ser. No. 782,905
Claims priority, application Japan, Mar. 31, 1976, 51-36385
Int. Cl.[2] F01C *21/00*
U.S. Cl. 418—178 **6 Claims**

1. Rotary piston engine comprising a casing which includes a rotor housing having a trochoidal inner wall and a pair of side housings secured to the opposite sides of the rotor housing to define a cavity therein, and a substantially polygonal rotor disposed in said cavity for rotation with apex portions in sliding engagement with the inner wall of the rotor housing, said rotor being provided at each apex portion with an apex seal of iron-based material which includes 50 to 75% in volume of carbide at least in a sliding surface which is adapted to be brought into sliding engagement with the inner wall of the rotor housing, said apex seal having a hardness of 700 to 900 in Vickers' scale at the sliding surface, said rotor housing including a base which is made of an iron-based material having a hardness of not less than 105 in Vickers' scale and provided at its inner wall with a chromium-plated layer having a hardness not less than 850 in Vickers' scale, the hardness of the rotor housing base and that of the chromium-plated layer being in a region defined in a chart having an ordinate representing the



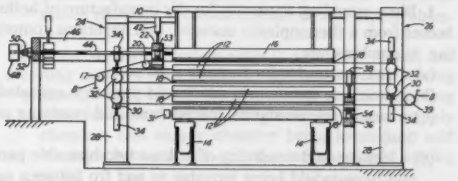
hardness of the rotor housing base and an abscissa representing the hardness of the chromium-plated layer by a line connecting a first point which corresponds to the base hardness of 180 and the plated layer hardness of 850 and a second point which corresponds to the base hardness of 125 and the plated layer hardness of 950, and also by a further line connecting said second point and a third point which corresponds to the base hardness of 105 and the chromium plated layer hardness of 1200, all in Vickers' scale, said region being at a side of the lines wherein the values of the hardness are greater than those on the lines.

4,094,619

APPARATUS FOR STRETCHING AND STRIPPING BELTING IN A MULTIPLATEN PRESS

David Weinschenk George, New Castle, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed Aug. 20, 1976, Ser. No. 716,329
Int. Cl.[2] B29H *7/22*
U.S. Cl. 425—135 **7 Claims**



1. In combination with a three or more movable platen press for processing belting, fed in a continuous manner through openings formed by the platens of the press and having alternate belting portions arranged between said openings, entry and delivery tensioning devices for the belting comprising:

entry clamping means arranged adjacent the entry side of said press,

delivery clamping means arranged adjacent the delivery side of said press,

means for moving said entry clamping means to effect a clamping of a portion of the belting fed into said entry clamping means and for moving said entry clamping means,

said entry and delivery tensioning devices arranged on the entry and delivery sides of the press and including belting supporting means for receiving different portions of the belting from different openings of the press during said

feeding and for supporting the belting during said tensioning,

means for mounting said belting supporting means relative to said press so as to only be movable in a direction parallel to the movement of said press platens, and

means for selectively moving said belting supporting means in said direction parallel to said movement of said press platens, in concert with said press platens and independently of said press platens.

4,094,620

APPARATUS FOR THE MANUFACTURE OF HOLLOW BODIES OF A THERMOPLASTIC BY BLOW-MOULDING

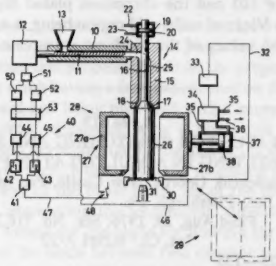
Werner Daubenbüschel, Bensberg-Refrath; Alfred Thomas, Dambroich; Dieter Hess, Swistal-Morenhoven, and Hans-Rüdiger Augst, Windeck, all of Germany, assignors to Kautex Maschinenbau GmbH, Bonn-Holzlar, Germany

Filed Oct. 1, 1976, Ser. No. 728,642

Claims priority, application Germany, Oct. 3, 1975, 2544171

Int. Cl.[2] B29D *23/04*

U.S. Cl. 425—140 5 Claims



1. Blow-moulding apparatus for the manufacture of hollow bodies from a thermoplastic material, said apparatus comprising, in combination:

(a) a screw-extruder for forming a parison;

(b) a receiving station into which said parison is extruded;

(c) a mould release station spaced from said receiving station;

(d) a blow-mould consisting of at least two openable parts, said blow-mould being movable to and fro between said receiving station and said mould release station, the open blow-mould encompassing the parison in the receiving station;

(e) means for detecting when the length of the parison extruded reaches a given length corresponding to the length of the blow-mould;

(f) control means operable only by said detecting means when the mould is at said receiving station, effective to close the mould parts on the parison;

(g) time-dependent open-loop control means effective to control the movement of the blow-mould, whereby it is in the open position in said receiving station before the length of said parison reaches said given length; and

(h) means for controlling the speed of the screw of the screw-extruder with a change of speed proportional to a change of time outside a predetermined range of times at which the parison reaches said given length, whereby the time for each mould cycle remains within said range.

4,094,621

DIE CLOSING UNIT WITH OVERSIZE INJECTION MOLDING DIE

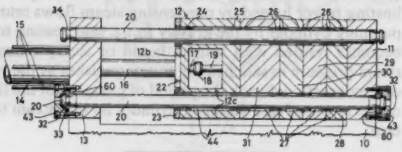
Karl Hehl, Arthur-Hehl-Str. 32, 7298 Lossburg, Germany

Division of Ser. No. 640,531, Dec. 15, 1975, Pat. No. 4,025,264, which is a continuation-in-part of Ser. No. 569,886, Apr. 21, 1975, abandoned. This application May 23, 1977, Ser. No. 799,577

Claims priority, application Germany, Dec. 13, 1974, 2459025

Int. Cl.[2] B29F *1/00;* B29C *3/02*

U.S. Cl. 425—190 6 Claims



1. In a die closing unit of an injection molding machine, defining a movement axis and having a stationary die carrier member and a movable die carrier member with opposing axially oriented mounting faces to which the component parts of a multi-plate injection molding die are removably attachable, which die is thereby closable and openable, as a result of an axial reciprocating movement of the movable die carrier member towards and away from the stationary die carrier member; in such a die closing unit, the combination comprising:

at least two parallel cylindrical tie rods extending between said stationary and movable die carrier members, the rods being transversely spaced apart;

an equal number of tie rod bores in each of the two die carrier members, the bores in one die carrier member forming a guiding engagement with the tie rods, while the bores in the other die carrier member form a seating engagement with end portions of the tie rods, the latter and said other die carrier member defining means for releasably connecting the tie rods to said die carrier member;

a multi-plate injection molding die having at least one stationary die plate attached to the stationary die carrier member, and at least one movable die plate attached to the movable die carrier member, the die plates having such an extent in the transverse or radial sense that they enclose the tie rods, having tie rod bores engaging the latter, so as to be guided and centered on the tie rods; and

means for forcibly retracting the tie rods from the connected die carrier member, after release of said connecting means, for the removal and insertion of die plates.

4,094,622

FOAM DEPOSITION APPARATUS

Hubert Stacy Smith, Jr., Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 634,997, Nov. 24, 1975, Pat. No. 4,034,027, which is a continuation of Ser. No. 487,073, Jul. 10, 1974, abandoned, which is a continuation of Ser. No. 302,840, Nov. 1, 1972, abandoned. This application Oct. 15, 1976, Ser. No. 732,626

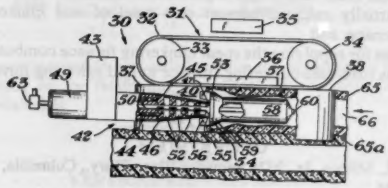
Int. Cl.[2] B29D *27/04*

U.S. Cl. 425—224 6 Claims

1. In an apparatus for the deposition of hardenable foamable resin in the form of a hollow strip, the apparatus comprising in cooperative combination a foam depositing head, the depositing head comprising a frame, the frame having at least first and second foam restraining means, a drive means operatively associated with said depositing head to advance the depositing head at a desired rate, a means operatively associated with said first and second restraining means to dispense foamable hardenable synthetic resinous material within the first and second restraining means, the dispensing means having a deflecting

means to generally radially outwardly direct the hardenable foamable material by centrifugal force, the improvement which comprises

a rotatable mandrel affixed generally adjacent the dispensing means,



means connected to said mandrel to rotate said mandrel relative to the restraining means, the mandrel being disposed between the first and second restraining means and to contact the hardenable foamable resin during at least the initial portion of its foaming and hardening to thereby form a hollow foamed strip having a passageway therein of generally uniform cross section.

4,094,623

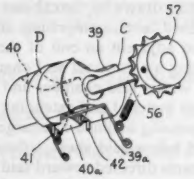
DOUGH DISPENSING AND SUPPORT APPARATUS

Jacob T. Nelson, 105 W. Lee Rd., Taylors, S.C. 29682

Filed Dec. 27, 1976, Ser. No. 754,335

Int. Cl.² A21C *5/00*

U.S. Cl. 425—227 **14 Claims**



1. Dough dispensing apparatus comprising:

a dough containing chamber having a dough dispensing outlet;

rotatable cylindrical molding means carried across said outlet having spaced dough receiving cavities formed therein for receiving a mass of said dough flowing from said chamber and dispensing said dough through said outlet as said dough cavity is rotated;

a stationary disk carried between said space cavities:

an annular peripheral portion of said disk extending substantially coextensively with a peripheral portion of said cylindrical molding means providing a separator wall between said cavities for separating said dough mass between said dough cavities;

abutment means carried by said disk extending therefrom into engagement with said chamber adjacent said outlet maintaining said disk stationary in relation to said chamber as said cylindrical molding means is rotated.

4,094,624

CENTRIFUGAL CASTING APPARATUS

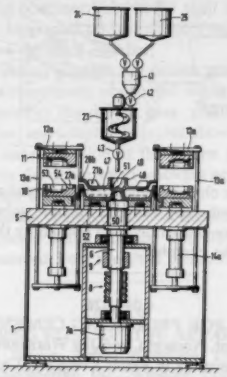
Richard Halm, Silcherstrasse 54, D 7061 Baltmannsweiler, Germany

Filed Dec. 23, 1976, Ser. No. 753,885

Claims priority, application Germany, Dec. 27, 1975, 2558893

Int. Cl.² B29C *5/04*

U.S. Cl. 425—434 **9 Claims**



1. A centrifugal casting apparatus for producing cast articles from casting resin comprising the combination of

a turntable having an axis of rotation;

means for supporting and rotating said turntable about said axis;

a supply tank on said turntable and rotatable therewith, said supply tank having

a supply chamber adapted to receive and hold a quantity of casting resin before said turntable is rotated,

casting nozzle means for conducting casting resin by centrifugal force out of said supply chamber when said turntable is rotated and for preventing flow of resin out of said chamber when said turntable is at rest,

filler means for receiving casting resin and for conducting said resin into said supply chamber, and

means in said filler means for indicating the degree to which said supply chamber has been filled with resin before the resin is conducted out of said supply chamber;

means for supplying casting resin to said filler means; and

a casting mold on said turntable, said casting mold having means on said casting mold defining an inlet opening directed toward said casting nozzle on said supply chamber; said supply chamber being located on said turntable between said axis of rotation and said casting mold,

said supply chamber having a resin capacity substantially equal to the internal volume of said casting mold.

4,094,625

METHOD AND DEVICE FOR EVAPORATION AND THERMAL OXIDATION OF LIQUID EFFLUENTS

Robert Wang, Wissous, and Didier Brun, Saint-Cloud, both of France, assignors to Heurtey Effluthern, Paris, France

Filed Feb. 13, 1976, Ser. No. 657,898

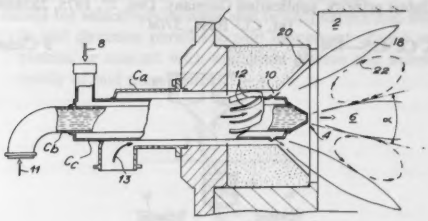
Claims priority, application France, Feb. 28, 1975, 75 06303; Jul. 2, 1975, 75 20818

Int. Cl.² F23M *3/00*; F23Q *9/00*

U.S. Cl. 431—9 **15 Claims**

1. A method of evaporation and thermal oxidation of liquid effluents in which said effluents are continuously vaporized by a flame, comprising rotating a jet of gaseous oxidizer, introducing a fluid fuel into the jet of oxidizer, igniting and introducing the oxidizer-fuel mixture into a chamber in a rotating out-

wardly diversing annular jet and introducing a jet of atomized liquid effluent into said chamber with said jet of atomized liquid effluent being concentric to and geometrically distinct in



the vicinity of the chamber inlet from the rotating jet of oxidizer-fuel mixture whereby the combustible substances of said liquid effluents are evaporated and burned by the jet of ignited mixture within the chamber.

4,094,626

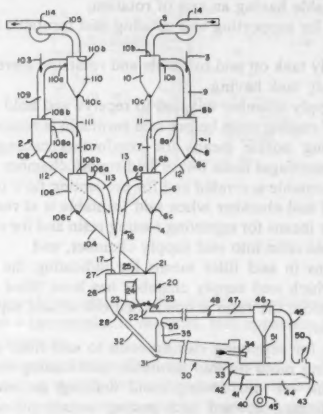
APPARATUS FOR PRODUCING CEMENT CLINKER

Donald S. Boyhont, Nazareth, and Jay Warshawsky, Allentown, both of Pa., assignors to Fuller Company, Catasauqua, Pa.

Filed Nov. 23, 1976, Ser. No. 744,364

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—58 **11 Claims**



1. Apparatus for burning cement raw meal to produce cement clinker comprising:

a pair of parallel suspension preheaters, each including means for supplying hot gases to the bottom thereof for passage upwardly through the suspension preheater and means for supplying cement raw meal to the top thereof for passage downwardly through the suspension preheater generally countercurrent to the flow of hot gas whereby the cement raw meal is heated by the hot gas;

a single calcining furnace having an inlet for combustion gas, an inlet for heated cement raw meal, means for producing combustion within the calcining furnace for at least partially calcining the cement raw meal and an outlet for spent calcining furnace combustion gas and the at least partially calcined cement raw meal;

a single separator flow connected to the outlet of the calcining furnace for separating the at least partially calcined cement raw meal from the spent calcining furnace combustion gas;

means for supplying the separated spent calcining furnace combustion gas from said single separator to both of said parallel suspension preheaters to thereby provide the means for supplying hot gases to the bottom of each suspension preheater;

a cement clinkering furnace having an inlet for at least partially calcined raw material, an outlet for cement clinker, means for supplying combustion gas thereto, means for producing combustion within the cement clinkering furnace and an outlet for spent clinkering furnace combustion gas;

means for supplying at least partially calcined cement raw meal from said single separator to the inlet for at least partially calcined cement raw meal of said clinkering furnace; and

means for supplying the spent clinkering furnace combustion gas from said clinkering furnace to said calcining furnace.

4,094,627

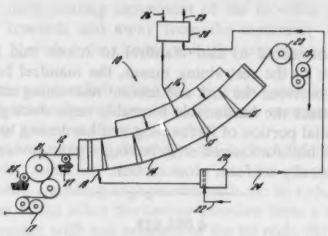
OVEN SYSTEM

Clare L. Milton, Jr., 9325 Snowden River Pkwy., Columbia, Md. 21046

Continuation of Ser. No. 521,525, Nov. 6, 1974, abandoned, and a continuation-in-part of Ser. No. 464,185, Apr. 25, 1974, abandoned. This application Sep. 15, 1975, Ser. No. 613,641

Int. Cl.[2] F27B *9/28*; F23J *15/00*

U.S. Cl. 432—59 **28 Claims**



21. In an elongated oven having openings at both ends for the introduction and removal of substantially flat sheet material conveyed therethrough, a hot air supply system for introducing hot air into said oven and an exhaust system for exhausting hot air therefrom, a sealing system for maintaining the amount of room air drawn by the exhaust system into said oven at a predetermined level, comprising, in combination, a seal chamber located adjacent an end of the oven, an air supply system for forcing air into said seal chamber through curtain air jets located within said chamber and disposed on opposite sides of the sheet material and extending laterally thereacross, said air jets containing inclined discharge openings to provide, both above and below said sheet, substantially identical curtain-like air streams directed toward said sheet in the direction opposite to the travel thereof, an exhaust means opening through the top and bottom of said chamber for exhausting from said chamber air forced therein through said jet means, and means for regulating the amount of air forced through said jets to provide control of leakage into the oven.

4,094,628

ROTARY DRUM

Poul Rasmussen, and Helge Carl Christian Kartman, both of Copenhagen, Denmark, assignors to F. L. Smith & Co., Cresskill, N.J.

Filed Jan. 21, 1976, Ser. No. 650,920

Claims priority, application United Kingdom, Jan. 22, 1975, 2842/75

Int. Cl.[2] F27D *15/02*; F27B *7/14*

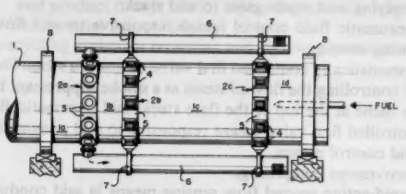
U.S. Cl. 432—80 **33 Claims**

1. A rotary drum for treating materials comprising:

a drum shell having a generally tubular configuration wall;

one or more material treating members, each comprising a unitary member having a circumferential portion which

forms a portion of said wall and a generally radial portin integral therewith and projecting radially inwardly or outwardly from said wall; and



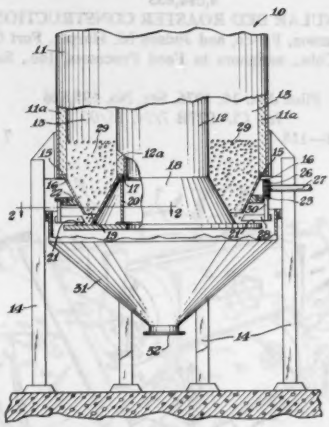
means secured to said radial portion for supporting a cooler tube or for facilitating the direct advancement of said materials.

4,094,629

VERTICAL KILN APPARATUS

Eddie Lee Greenawalt, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 22, 1977, Ser. No. 770,861
Int. Cl.[2] F27B 9/14; F27D 3/00
U.S. Cl. 432—98 8 Claims



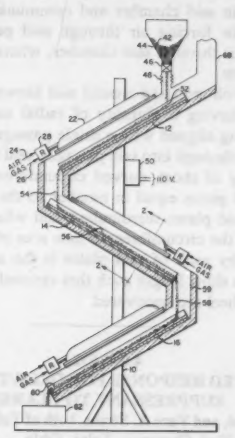
1. A vertical kiln apparatus for firing an aggregate material which comprises:
- a first upright cylindrical shaft defining a wall which has a bottom end;
- a second upright cylindrical shaft defining a wall which has a bottom end;
- the second shaft enclosing the first shaft, with the second shaft wall being spaced from the first shaft wall to define an annular kiln chamber between said shaft walls;
- the kiln chamber being adapted to receive and contain an aggregate material;
- a first cone member having a wall with a top end and a bottom end, the first cone wall sloping outwardly and downwardly from the top end, and the first cone wall being joined at its top end to the bottom end of the first shaft wall;
- a second cone member having a wall with a top end and a bottom end, the second cone wall sloping inwardly and downwardly from the top end, and the second cone wall being joined at its top end to the bottom end of the second shaft wall;
- the bottom end of the second cone wall being spaced from the first cone wall to define an outlet for the annular kiln chamber;
- a plate member fastened along its upper surface to the bottom end of the wall of the first cone member, the upper surface of said plate extending beyond the outer edge of the bottom end of said first cone wall, the extended surface defining a shelf member below the kiln chamber outlet, the shelf member being adapted to support the aggregate material during a downward movement of the aggregate material from the kiln chamber, through said outlet, and onto the shelf member;
- a support member fastened to the wall of the second cone member, and positioned above the shelf member;
- a driven gear supported by said support member, and positioned above the shelf member;
- a driver gear which engages the driven gear;
- a drive means operatively connected to the driver gear;
- a means fastened to the driven gear, positioned above the shelf member, and adapted to travel above the shelf member in the same direction as the driven gear to continuously remove the downwardly moving aggregate material from the shelf member; and
- a collection means positioned below the shelf member, said collection means being adapted to collect the aggregate material removed from the shelf member.

4,094,630

WELDING FLUX CURING APPARATUS

James Franklin Turner, Signal Mountain, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 8, 1976, Ser. No. 721,633
Int. Cl.[2] F27B 9/14
U.S. Cl. 432—134 6 Claims



1. An apparatus for curing bonded welding flux comprising:
- a. an upper inclined plane;
- b. at least one intermediate inclined plane;
- c. a lower inclined plane, each of said planes inclined at an angle less than the angle of repose of material being cured;
- d. a support supporting said inclined planes with the lower end of said upper plane over an upper portion of the intermediate plane and the lower end of said intermediate plane over the upperportion of said lower plane;
- e. means for vibrating said inclined planes;
- f. means for feeding uncured flux to the upper portion of said upper inclined plane, whereby the flux traverses said inclined planes;
- g. heating means for radiantly heating the flux as it traverses throughout a substantial portion of each of said inclined planes, said heating means being above and parallel to each of said inclined planes; and
- h. side plates joining each of said inclined planes with its respective heating means, whereby a flow passage is

formed therebetween, the flow passage being substantially unrestricted throughout its length.

4,094,631

MULTIPLE OUTLET BLOWER SCROLL FOR AN INDUSTRIAL OVEN

Douglas V. Grieve, 212 Hazelwood Dr., Lindenhurst, Ill. 60046

Continuation of Ser. No. 649,406, Jan. 15, 1976, abandoned. This application Mar. 28, 1977, Ser. No. 781,680

Int. Cl.[2] F27B *3/22*

U.S. Cl. 432—176 **2 Claims**

1. An improved industrial oven of the type including a housing defining a work chamber, a duct system including a plurality of passages within said chamber, a plurality of heating elements mounted within said passages, a blower wheel mounted within said chamber and communicating with said duct system for forcing air through said passages so as to circulate hot air through said chamber, wherein the improvement comprises:

a blower scroll mounted around said blower wheel;

said scroll having a plurality of radial outlets, each said outlet being aligned with a single passage, to allow air to pass therethrough into said passages, said scroll defined by a plurality of short, curved circumferentially extending individual plates equal in number to the number of said outlets, said plates surrounding said wheel and of a size such that the circumferential face area of said wheel surrounded by each of said plates is the same, said plates being of a short length such that circumferential portions of said wheel are uncovered.

4,094,632

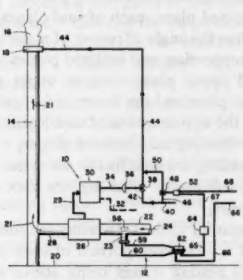
ACCELERATED RESPONSE FOR DELIVERY OF SMOKE SUPPRESSANT TO FLARES

Robert D. Reed, and Vern A. Street, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Feb. 7, 1977, Ser. No. 766,133

Int. Cl.[2] F23D *13/20*

U.S. Cl. 431—202 **8 Claims**



1. In a flare system for the smokeless burning in the atmosphere, of suddenly released flows of waste gases, said system including;

(a) conventional first flow sensing means in the conduit supplying said waste gases to said stack;

(b) pneumatic fluid control means responsive to said flow sensing means;

(c) pneumatically controlled first valve means in a steam line for controlling the flow of steam as a smoke suppressant to the flame at the top of the flare stack; said pneumatically controlled first valve means responsive to said pneumatic fluid control means;

the improvement comprising;

(d) rapid-acting second flow sensing means in said conduit supplying said waste gases;

(e) first and second pressure lines from said second flow sensing means connected to a fast-acting electrical pressure switch;

(f) said pressure switch controlling a solenoid operated second valve connected into said steam line in parallel with said first valve to supply steam to said flare stack, and

(g) time delay means for opening the electrical circuit to said solenoid operated valve after it has been operated for a selected time interval.

4,094,633

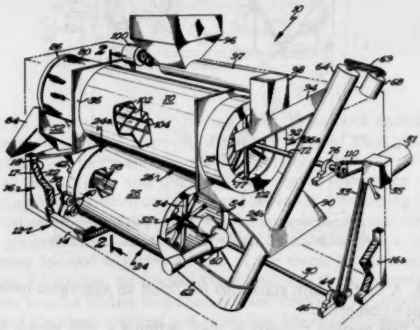
GRANULAR BED ROASTER CONSTRUCTION

Don G. Peterson, Frisco, and Judson M. Harper, Fort Collins, both of Colo., assignors to Food Processes, Inc., Saginaw, Mich.

Filed Jun. 14, 1976, Ser. No. 695,826

Int. Cl.[2] F27B *7/14, 15/00*

U.S. Cl. 432—118 **7 Claims**



1. A granular bed roasting apparatus usable with heat transferring granular material for heating a product, said apparatus comprising:

a rotatable granular material heating bin adapted to contain only heat transferring granular material, said heating bin comprising an internally defined granular material heating chamber and a plurality of granular material lifting flights disposed within said heating chamber and extending inwardly therefrom from said bin a predetermined distance for continuously picking up and dropping granular material through said granular material heating chamber in response to rotation of said bin;

heating means associated with said heating bin for directly heating the interior of said heating chamber and applied directly to granular heat transfer material dropped by said lifting flights and falling within said chamber;

a rotatable product roaster bin separate from said heater bin for heating a product;

means for inputting heated granular material outputted from said heating bin into said roaster bin;

means for inputting a raw product to be heated by said

apparatus into said roaster bin thereby commingling said product with said granular heat transfer material;

separation means adapted to receive material outputted from said product roaster bin for separating granular heat transfer material from product;

recycling means for returning and inputting granular materials separated from product to said rotatable heating bin; and

means for controllably rotating said heating bin and said roaster bin.

4,094,634

ANIONIC AND NONIONIC EMULSIFIED OPTICAL BRIGHTENER SUSPENSION WITH A HYDROTROPIC AGENT

Carl Becker, Basel; Jacques Wegmann, Bettingen, and Andres Schaub, Biel-Benken, all of Switzerland, assignors to Ciba Geigy AG, Basel, Switzerland

Division of Ser. No. 574,042, May 2, 1975, Pat. No. 4,042,320, which is a continuation-in-part of Ser. No. 506,775, Sep. 17, 1974, Pat. No. 3,997,828. This application May 11, 1977, Ser. No. 797,374

Claims priority, application Switzerland, May 9, 1974, 6374/74; Sep. 2, 1974, 11896/74; Dec. 18, 1974, 16894/74

Int. Cl.[2] D06L *3/12;* D06P *1/44*

U.S. Cl. 8—1 W 12 Claims

1. An aqueous stable, highly concentrated finely dispersed flowable optical brightener composition comprising at least 10% by weight of water, at least 30% by weight of at least one finely dispersed optical brightener insoluble to difficultly soluble in water having a particle size smaller than 10μ and a mixture consisting of at most 10% by weight of an anion-active dispersing agent, at most 5% by weight of a nonionic dispersing agent and at most 35% by weight of a hydrotropic agent capable of converting the optical brightener into a stable deflocculated form.

4,094,635

META-AMINOPHENOL SULFONAMIDES AS COUPLERS IN HAIR DYE COMPOSITIONS

Andrée Bugaut, Boulogne, and Chantal S. Fourcadier, Paris, both of France, assignors to L'Oreal, Paris, France

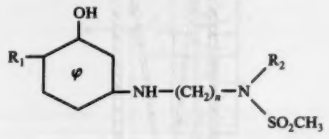
Filed Sep. 13, 1976, Ser. No. 722,610

Claims priority, application France, Sep. 9, 1976, 76 27125

Int. Cl.[2] A61K *7/12;* C07C *143/72*

U.S. Cl. 8—11 11 Claims

1. A dyeing composition for keratinic fibers or for human hair, containing an aqueous solution of at least one oxidation base which contains as a coupler, at least one compound of the formula



(I)

in which R_1 represents an alkyl having 1 to 4 carbon atoms, R_2 represents hydrogen or an alkyl having 1 to 4 carbon atoms, and n is a number having a value of 2 or 3.

4,094,636

PROCESS FOR DYEING CELLULOSE FIBERS WITH WATER-INSOLUBLE AZO DYESTUFFS PRODUCED ON THE FIBER

Hans-Ulrich von der Eltz, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

Filed Jan. 28, 1977, Ser. No. 763,557

Claims priority, application Germany, Jan. 30, 1976, 2603444

Int. Cl.[2] C09B *27/00;* D06P *3/12*

U.S. Cl. 8—46 2 Claims

1. In a process for dyeing or printing cellulose fibers with azo dyestuffs produced on the fiber by treating with an aqueous liquor or printing paste containing an azoic coupling component, a solution or dispersion of a diazotizable primary aromatic amine, an alkaline agent and sodium nitrite with subsequent acid treatment, the improvement comprising using a diazotizable primary aromatic amine which contains a carboxylic acid ester or amide group, and which does not contain any group rendering soluble in water the azo dyestuff formed.

4,094,637

PROCESS FOR THE PRINTING WITH DEVELOPING DYES

Erich Feess, Hofheim, Taunus; Willy Gronen, Kelkheim, Taunus, and Hasso Hertel, Muhlheim (Main), all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 17, 1975, Ser. No. 623,338

Claims priority, application Germany, Oct. 19, 1974, 2449782; Mar. 17, 1975, 2511537

Int. Cl.[2] C09B *27/00;* D06P *1/02*

U.S. Cl. 8—71 10 Claims

1. A process for printing cellulosic textile material with a printing paste containing

a. the alkaline solution of a coupling component capable of forming developing dyes,

b. the dispersion of a diazotble amine capable of forming developing dyes, said amine having an average particle size of 0.002 mm or less,

c. sodium nitrite and

d. a thickener,

which process comprises printing said textile material with said printing paste, drying said printed material, developing the dyestuff on the fiber either by acidic steaming or by adding a dilute aqueous solution of an organic acid of which at least 30 g are soluble in 100 g water, having at 20° C a pK value of 4 to 2.5 and at normal pressure a boiling point above 175° C, and steaming said material with neutral steam or immediately drying it.

4,094,638

APPARATUS FOR THE CONTINUOUS THERMAL STERILIZATION OF PACKING

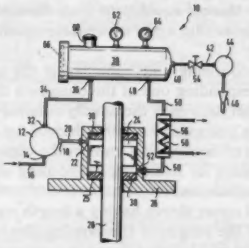
Erich Todtenhaupt; Wolfgang Müller, both of Schopfheim; Hans Schupper, Zell, and Walter Geng, Schopfheim, all of Germany, assignors to Ekato-Werk, Schopfheim, Germany

Filed Nov. 8, 1976, Ser. No. 740,017

Claims priority, application Germany, Dec. 15, 1975, 2556467

Int. Cl.[2] A61L *1/00;* F16J *15/00;* F16K *49/00*

U.S. Cl. 21—61 7 Claims



1. An apparatus for the continuous thermal sterilization of packings on rotating and/or reciprocating shafts, comprising:

a steam ejector means for supplying steam as a source of heat for said thermal sterilization of said packings, said steam ejector means in communication with a mixing tank means,

a mixing tank means for mixing water with said steam to form hot water for said thermal sterilization of said packings,

means for supplying water to said mixing tank means in communication with said mixing tank means,

an outlet means in communication with said mixing tank means at a level effective to maintain at least a portion of said water in said mixing tank means,

a temperature sensing valve means in communication with said outlet means for measuring the temperature of said water in said mixing tank means and for releasing water from said apparatus when the water temperature in said

mixing tank means falls below a pre-determined value, thereby permitting additional steam to enter the apparatus and increase the water temperature,

a chamber means in communication with said mixing tank means and also in communication with said steam ejector means containing packings for sealing a rotating and/or reciprocating shaft, thereby permitting said hot water to effect thermal sterilization of said packings, and

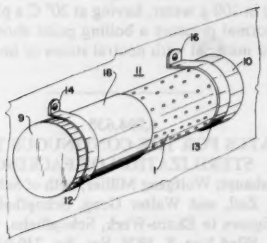
a pump means in communication with said chamber means for circulating said hot water in a closed circuit through said steam ejector means, said mixing tank means, said chamber means and again through said steam ejector means.

4,094,639

DEODORIZER

Ronald J. McMillan, Fort Lauderdale, Fla., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 15, 1977, Ser. No. 787,775
Int. Cl.[2] A61L *3/00, 9/01, 9/04*
U.S. Cl. 21—74 R **1 Claim**



1. A deodorizer, comprising

an elongated perforated cylindrical housing sleeve having spaced opposite first and second ends with a partition at the center thereof equidistant from the ends dividing the housing sleeve into a pair of separate equally dimensioned chambers;

a pair of deodorizing units mounted in the housing sleeve, each in a corresponding one of the chambers thereof;

a pair of cover caps each threadedly coupled to the housing sleeve at a corresponding end thereof for facilitating replacement of deodorizing units in the chambers;

mounting means for mounting the housing sleeve on a supporting surface; and

a cylindrical cover sleeve having a length equal to substantially half the length of the housing sleeve and slidably mounted on said housing sleeve in a manner whereby said cover sleeve covers one of the chambers of the housing sleeve while freeing the other so that the deodorizing unit in the one of the chambers is preserved while the deodorizing unit in the other of the chambers deodorizes the surrounding area, said cover sleeve being freely slidable on said housing sleeve for selectively varying the strength of deodorant transmitted from said housing sleeve.

4,094,640

METHOD FOR PROCESSING BIOMATERIALS

Georg Iwantscheff, Nuremberg, and Egmont Scheubeck, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

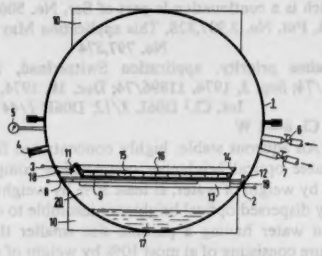
Filed Jan. 31, 1977, Ser. No. 764,541
Claims priority, application Germany, Feb. 12, 1976, 2605560
Int. Cl.[2] G01N *31/12*
U.S. Cl. 23—230 PC **12 Claims**

1. A processing method for breaking down biomaterial comprising:

a. disposing 20–30g of a moist sample of the biomaterial in a closed pressure vessel;

b. predrying said sample down to a residual moisture of 5–10%;

c. cooling the wall of the pressure vessel to about 10° C. during the predrying; and



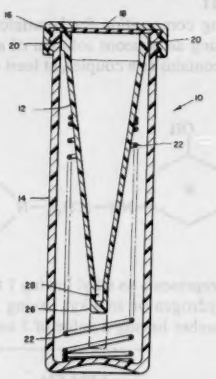
d. subsequently burning in oxygen, within the closed pressure vessel, the predried biomaterial in the presence of the water vapor generated during pre-drying and which has been condensed on the wall of the pressure vessel.

4,094,641

LOW LOSS SAMPLE BOTTLE ASSEMBLY

David R. Friswell, Holliston, Mass., assignor to Waters Associates, Inc., Milford, Mass.

Filed Feb. 25, 1977, Ser. No. 772,146
Int. Cl.[2] B01L *3/00*
U.S. Cl. 23—230 R **9 Claims**



1. A container assembly adapted to facilitate the removal of liquid contained therein into a needle having an upper hollow portion, said portion terminating at its lower end in a port, and a lower solid portion below said port, said assembly comprising:

(a) a sample bottle having a lower internal portion with a recess of smaller circumference than the circumference of the bottle internal upper portion,

(b) a member surrounding and supporting said sample bottle substantially erect for vertical movement with respect to said member,

(c) a resilient means positioned in said member below said sample bottle resiliently to resist downward and sideward movement of said bottle,

(d) said lower portion of said sample bottle having an internal shape complementary to the external shape of a solid lower portion of a hollow needle having a port adjacent and above the solid portion,

said sample bottle lower portion being capable of closely

mating with a said solid lower portion of a hollow needle to displace excess liquid in said sample bottle lower portion upward,

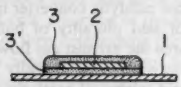
whereby the displaced liquid may be sucked into said port and said resilient means allows alignment and close mating of said needle and bottle.

4,094,642

INDICATOR FOR ETHYLENE OXIDE GAS

Mitsuhiro Sumimoto, Chiba, and Haruo Kohama, Tokyo, both of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1977, Ser. No. 768,850
Int. Cl.² G01N *21/12*
U.S. Cl. 23—254 R **19 Claims**



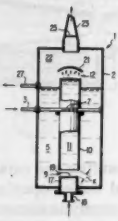
11. An indicator structure for ethylene oxide gas which comprises a substrate and a layer of indicator composition disposed on the substrate and comprising 4-(4-nitrobenzyl)-pyridine, nitrocellulose, a basic substance, and a blue coloring agent.

4,094,643

AMMONIUM NITRATE NEUTRALIZER

Toby M. Cook; Gerald L. Tucker, and Marion L. Brown, all of Yazoo City, Mich., assignors to Mississippi Chemical Corporation, Yazoo City, Mich.

Filed Sep. 16, 1976, Ser. No. 723,929
Int. Cl.² C01C *1/18*; B01F *5/10*
U.S. Cl. 23—285 **6 Claims**



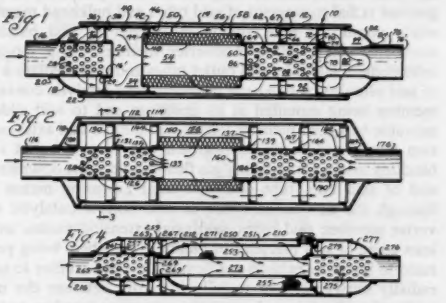
1. A thermal syphon-pressure pump neutralizer being adapted for neutralizing nitric acid with ammonia, comprises a reaction vessel suitable for containing an aqueous reaction medium and having a gas outlet in its upper end and a product outlet spaced below said gas outlet, at least one elongated fluid impervious cylindrical member positioned substantially vertically within said vessel so as to define a second reaction zone within said member and a first reaction zone outside said member between said member and said vessel, the lower end of said cylindrical member being an inlet being situated in said vessel such that said inlet of said cylindrical member is spaced above the bottom of the vessel, ammonia inlet means leading into the bottom of said reaction vessel being in close proximity to but spaced below said inlet of said cylindrical member, nitric acid inlet means leading into said first reaction zone being spaced a predetermined distance above said inlet of said cylindrical member and below the level of said product outlet of said vessel, said apparatus being operable for neutralizing nitric acid with ammonia by filling said vessel with an aqueous medium at least to the level of said product outlet and introducing nitric acid into said first reaction zone through said nitric acid inlet means and ammonia into the reaction vessel through said ammonia inlet means, and diluting the concentration of the nitric acid before entering said second reaction zone, so that the major portion of nitric acid being introduced through said nitric acid inlet means will be neutralized with the ammonia being introduced through said ammonia inlet means in said dilute concentration within said second reaction zone, and whereby circulation mixing and turbulence of the aqueous medium, nitric acid and ammonia between said first reaction zone and said second reaction zone is facilitated by a thermal syphon and pressure effect caused by the heat of neutralization and the density differential between the product solution and the reacted solution such that water vaporized by said heat of neutralization will be discharged through said gas outlet of said reaction vessel and ammonium nitrate product will be recovered through said product outlet of said reaction vessel, wherein the improvement comprises: said reaction vessel further containing a free gas zone between said reaction zones and said gas outlet being situated such that gases disengaging from said first reaction zone will enter said free gas zone, and then into said gas outlet, deflector means situated above said second reaction zone and depending thereabout to at least the level of said product outlet such that solution and gases evolved from the outlet of said second reaction zone are substantially completely reintroduced into the liquid in said first reaction zone before entering said free gas zone above said first reaction zone with sufficient force so as to create a scrubbing turbulence within said first reaction zone, whereby turbulent contact between said liquid within said first reaction zone and said gases will scrub the gases and cause dissolution of soluble components of said gases into said liquid, such that gases emanating from said first reaction zone into said free gas zone are substantially completely scrubbed of soluble components.

4,094,644

CATALYTIC EXHAUST MUFFLER FOR MOTORCYCLES

Melvin H. Wagner, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 8, 1975, Ser. No. 638,778
Int. Cl.² B01J *8/00*; F01N *3/15*
U.S. Cl. 23—288 F **7 Claims**



1. An exhaust muffler comprising a metal exhaust inlet tube and a coaxial metal exhaust outlet tube, said tubes being longitudinally spaced from each other and welded adjacent their far ends to an elongated metal housing member, said metal housing member having a larger diameter than said tubes and being joined to said tubes by inlet and outlet transition portions; an elongated, hollow, annular, radial flow catalytic converter member comprising a monolithic ceramic substrate positioned intermediate the inner ends of said tubes and axially aligned therewith, said catalytic converter member having its radially outer surface spaced inwardly from the inner wall of said metal housing, a plurality of bulkhead members fixedly mounted relative to portions of said tubes inwardly of the far ends thereof for axial movement with said tubes as said tubes move inside and relative to said housing due to temperature differences between said tubes and said housing, at least one of said bulkhead members being inwardly axially spaced from both

said inlet and outlet tubes, said plurality of bulkhead members including axially extending flange portions which contact the inner wall of said housing around their periphery so as to prevent radial movement of said tubes and bulkhead members while permitting axial sliding movement of said bulkhead members; said catalytic converter member being mounted intermediate said inlet and outlet tubes and intermediate a pair of said plurality of bulkhead members, said catalytic converter member being mounted at its upstream end to said one of said slidably movable bulkhead members which is inwardly axially spaced from said inlet and outlet tubes and at its downstream end to said outlet tube, blocking means for blocking gas flow through the downstream end of said inlet tube and through the downstream end of said hollow catalytic converter member; said tubes, and at least some of said plurality of bulkhead members being perforated to force the exhaust gas flow within said muffler to move radially outwardly and radially inwardly between the inner walls of said tubes and catalytic converter member and the inner walls of said metal housing in at least two cycles.

4. An exhaust muffler comprising a metal exhaust inlet tube and a coaxial metal exhaust outlet tube, said tubes being longitudinally spaced from each other and welded adjacent their far ends to an elongated metal housing member, said metal housing member having a larger diameter than said tubes and being joined to said tubes by inlet and outlet transition portions; an elongated, hollow, annular, radial flow catalytic converter member comprising a monolithic ceramic substrate positioned intermediate the inner ends of said tubes and axially aligned therewith, said catalytic converter member having its radially outer surface spaced inwardly from the inner wall of said metal housing, a plurality of bulkhead members fixedly mounted relative to portions of said tubes inwardly of the far ends thereof for axial movement with said tubes as said tubes move inside and relative to said housing due to temperature differences between said tubes and said housing, a tubular axial extension means mounted to the downstream end of said inlet tube and having a bulkhead member fixedly mounted thereto for axial movement therewith, said plurality of bulkhead members including axially extending flange portions which contact the inner wall of said housing around their periphery so as to prevent radial movement of said tubes and bulkhead members while permitting axial sliding movement of said bulkhead members; said catalytic converter member being mounted intermediate said inlet and outlet tubes and intermediate a pair of said plurality of bulkhead members, said catalytic converter member being mounted at its upstream end to said slidably movable bulkhead member which is affixed to said axial extension means and at its downstream end to said outlet tube, blocking means for blocking gas flow between the downstream end of said inlet tube and said axial extension means and through the downstream end of said hollow catalytic converter member; said tubes, said axial extension means, and at least some of said plurality of bulkhead members being perforated to force the exhaust gas flow within said muffler to move radially outwardly and radially inwardly between the inner walls of said tubes and catalytic converter member and the inner walls of said metal housing in at least two cycles.

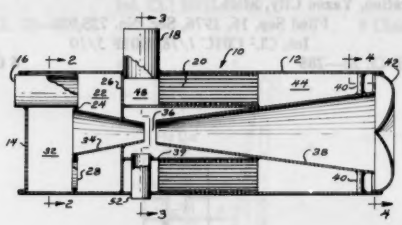
7. An exhaust muffler comprising a metal exhaust inlet tube and a coaxial metal exhaust outlet tube, said tubes being longitudinally spaced from each other and welded adjacent their far ends to an elongated metal housing member, said metal housing member having a larger diameter than said tubes and being joined to said tubes by inlet and outlet transition portions; an elongated, hollow, annular, radial flow catalytic converter member comprising a pair of perforated inner and outer housing portions which define a catalyst bed containing a plurality of catalyst coated pellets, said converter member being positioned intermediate the inner ends of said tubes and axially aligned therewith, said catalytic converter member having its radially outer housing portion spaced inwardly from the inner wall of said metal housing, a plurality of bulkhead members fixedly mounted relative to portions of one of said tubes for axial movement with said one tube as said tube moves inside and relative to said housing due to temperature differences between said tube and said housing, said plurality of bulkhead members including axially extending flange portions which contact the inner wall of said housing around their periphery so as to prevent radial movement of said tube and bulkhead members while permitting axial sliding movement of said bulkhead members; said catalytic converter member being mounted intermediate said inlet and outlet tubes and being slidably supported for axial movement at one end by one of said plurality of bulkhead members, and on the other end by a flexible bulkhead member affixed to said metal housing and the other of said tubes, said catalytic converter member having its inner and outer housing portions joined at one end by said flexible bulkhead member and at its other end by a transition member, blocking means for blocking gas flow through the downstream end of said inlet tube and through the upstream end of said hollow catalytic converter member; said tubes, and at least some of said plurality of bulkhead members being perforated to force the exhaust gas flow within said muffler to move radially outwardly and radially inwardly between the inner walls of said tubes and catalytic converter member and the inner walls of said metal housing.

4,094,645

COMBINATION MUFFLER AND CATALYTIC CONVERTER HAVING LOW BACKPRESSURE

Charles H. Bailey, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 24, 1977, Ser. No. 762,228
Int. Cl.[2] B01J *8/02, 35/04;* **F01N** *3/15*
U.S. Cl. 23—288 FC **7 Claims**



1. In a combination muffler and catalytic converter having a housing with inlet and outlet openings for exhaust gases, a monolithic, axial flow catalytic converter element, secondary air inlet means and a venturi for introducing secondary air into the exhaust gas stream before it reaches the catalytic converter element and for controlling the flow of exhaust gases to said catalytic converter element, the improvement comprising at least two serially arranged expansion chamber means located within said housing between said inlet and said venturi, said at least two serially arranged expansion chamber means comprising a first expansion chamber positioned axially inwardly of the inlet end of said housing and spaced therefrom by a second expansion chamber, said first chamber having the inlet cone portion of said venturi located therein and inlet means for communicating the second expansion chamber with said first expansion chamber, said second expansion chamber having a tube therein connecting and communicating the inlet opening of said housing with said first expansion chamber, whereby exhaust gases entering said inlet tube must undergo at least a 360° change in direction in passing from said inlet tube to said inlet cone portion, and gas restriction means extending over the entire gas flow path between the throat of said venturi and the inlet end of said catalytic converter element for controlling the expansion rate of the exhaust gases relatively uniformly over said entire gas flow path to minimize the turbulation of the gas stream, said gas expansion restriction means limiting the expansion rate of the exhaust gases to a rate no greater than the rate present in the expansion cone portion of the venturi

immediately downstream of the venturi throat which has an included angle with its axis no greater than about 7½°.

4,094,646

RAPID METHOD OF ASSAYING COLLAGEN IN MEAT AND MEAT PRODUCTS

David L. Stern, Baltimore, and Daniel B. Samchuck, Towson, both of Md., assignors to The Baltimore Spice Company, Baltimore, Md.

Filed Jun. 2, 1977, Ser. No. 802,600
Int. Cl.² G01N *21/24, 33/16*
U.S. Cl. 23—230 R 3 Claims

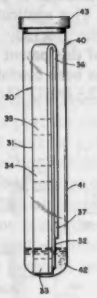
1. A rapid method for assaying collagen in a simple of meat or meat products comprising hydrolyzing the amino acids in said sample under conditions such that all of the tryptophan therein is destroyed and only a portion of the hydroxyproline therein is hydrolyzed and then determining the percent collagen by colorimetrically reading the present hydroxyproline which has been hydrolyzed and extracted.

4,094,647

TEST DEVICE

Marshall E. Deutsch, Sudbury, and Louis W. Mead, Lexington, both of Mass., assignors to Thyroid Diagnostics, Inc., Bedford, Mass.

Filed Jul. 2, 1976, Ser. No. 701,762
Int. Cl.² G01N *33/16*
U.S. Cl. 23—253 TP 14 Claims



1. A test strip for the detection of an ingredient of a sample which comprises:

a length of strip characterized by

a length of capillarity having a first and second end therealong,

a first zone located in said length of capillarity and spaced from said first end of the capillarity to permit contact of said first end but not said first zone with a developing liquid and impregnated with a first reagent,

said reagent being chosen to be mixable with said ingredient to provide a label therefor, and

a second zone located in said length of capillarity in the direction of said second end from said first zone and including a second reagent adapted to slow capillary movement of a portion of said first reagent carried by said developing liquid,

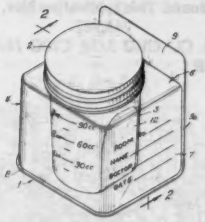
said length of capillarity being chosen to stop capillary transport therethrough while said portion of said first reagent is in said second zone, whereby a sample may be received in said length of capillarity and spaced from said first end of said capillarity to permit contact of said first end but not the place of sample reception with the developing liquid, said place of sample reception being in said length of capillarity between said first end and said second zone.

4,094,648

URINE SPECIMEN CONTAINER

Leonard Seeley, Palatine, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Jan. 28, 1977, Ser. No. 763,250
Int. Cl.² A61B *10/00;* B65D *23/00;* G01N *1/10, 33/16*
U.S. Cl. 23—259 10 Claims



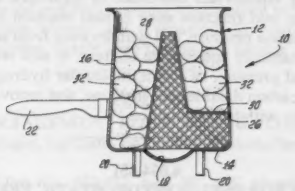
1. In a urine specimen container including a cup-shaped receptacle and a cap therefor, the improvement which comprises a shroud having a top portion extending outwardly from the top of the receptacle and a skirt portion depending from the periphery of said top portion across the front and along the two sides of the receptacle leaving the rear of the receptacle exposed, said skirt portion being spaced from the sides of the receptacle whereby fingers of a hand approaching the receptacle from the rear may pass under said shroud into the spaces on the respective sides of the receptacle to grasp and support the same while shielded by said shroud against the hazard of urine spillage.

4,094,649

BRIQUETTE IGNITING DEVICE WITH FORAMINOUS METAL CONE

Gordon A. Osterried, Box 65, Kelowna, British Columbia, Canada

Filed Feb. 28, 1977, Ser. No. 772,498
Int. Cl.² C10L *11/08, 11/00;* A47J *37/00*
U.S. Cl. 44—35 2 Claims



1. In a briquette igniting device, the combination of:

(a) an open-top container having a bottom wall and an upstanding peripheral wall;

(b) a handle connected to said container;

(c) said peripheral wall having air inlet openings therein adjacent said bottom wall;

(d) said peripheral wall having an enlarged access opening therein adjacent said bottom wall;

(e) a central, frusto-conical, foraminous member seated on said bottom wall and extending upwardly therefrom and spaced inwardly from said peripheral wall; and

(f) said foraminous member having at the lower end thereof a tubular portion extending laterally to and communicating with said access opening.

2. A briquette igniting device as defined in claim 1 wherein said bottom wall is provided with a central depression to receive a liquid fuel.

4,094,650

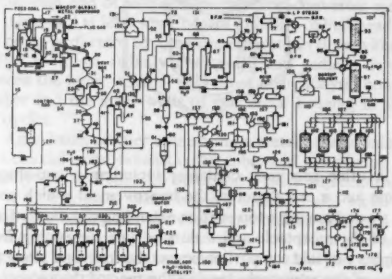
INTEGRATED CATALYTIC GASIFICATION PROCESS

Kwang K. Koh, West Bloomfield, Mich.; Nicholas C. Nahas, Morris Plains, N.J.; Robert E. Pennington, and Lonnie W. Vernon, both of Baytown, Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 514,852, Oct. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 287,319, Sep. 8, 1972, abandoned. This application Nov. 11, 1976, Ser. No. 740,987

Int. Cl.[2] C10J 3/54; C10G 13/30

U.S. Cl. 48—197 R 19 Claims



1. A process for the production of methane from a heavy oil or solid carbonaceous feed material and steam which comprises reacting said steam with said feed material to form essentially methane and carbon dioxide while suppressing the net formation of carbon monoxide and hydrogen in a reaction zone at a reaction temperature between about 1000° F. and about 1500° F. and at a reaction pressure in excess of about 100 psia, in the presence of a carbon-alkali metal catalyst comprising a carbon-alkali metal reaction product prepared by heating an intimate mixture of carbonaceous solids and an alkali metal constituent to an elevated temperature, said catalyst being present in a sufficient quantity to substantially equilibrate the gas phase reactions occuring during the reaction of said steam with said feed material, and in the presence of sufficient added equilibrium amounts, at said reaction temperature and pressure, of molecular hydrogen and carbon monoxide to provide substantially equilibrium quantities of hydrogen and carbon monoxide in said reaction zone at said reaction temperature and said reaction pressure, and withdrawing from said reaction zone a substantially equilibrium mixture, at said reaction temperature and pressure, of steam, molecular hydrogen, carbon monoxide, carbon dioxide, and methane, and recovering methane from the withdrawn mixture.

4,094,651

PROCESS FOR PSEUDOHYDROSTATIC FEEDING OF SOLIDS INTO A REACTOR

Ernest E. Donath, P.O. Box 1068, Christiansted, St. Croix, V.I. 00820

Continuation of Ser. No. 683,810, May 6, 1976, abandoned. This application May 26, 1977, Ser. No. 800,847

Int. Cl.[2] C10J 3/46

U.S. Cl. 48—210 8 Claims

1. In a method for the continuous reaction of pulverized coal with gases or vapors at a pressure of at least 80 psi, and including shutdown of the operation as required the improvement comprising continuously feeding said pulverized coal into a reaction zone utilizing the pseudohydrostatic pressure of a fluidized column which is of a height of at least 200 feet and includes additions of fluidizing gas at selected points of the column, by passing said pulverized coal downwardly through said column at a descent velocity of the pulverized coal in the column which is greater than the ascent velocity of the fluidizing gas relative to the pulverized coal, the average velocity of the fluidizing gas in the column being between 0.01 and 0.1 feet per second relative to the fluidized coal and the descent velocity of said coal being at least 1 foot per second, said method further including removing excess gas below the top of said

column during said shutdown and further comprising controlling the feed rate at the bottom of said column by throttling the flow of coal, a pressure reduction of up to 5 percent of absolute being effected by said throttling.

4,094,652

ELECTRODESORPTION SYSTEM FOR REGENERATING A DIELECTRIC ADSORBENT BED

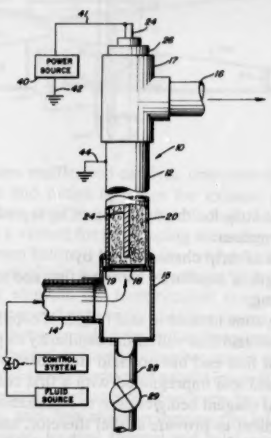
Frank Eugene Lowther, Buffalo, N.Y., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 625,237, Oct. 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 527,832, Nov. 27, 1974, abandoned. This application Feb. 15, 1977, Ser. No. 768,763

The portion of the term of this patent subsequent to Jul. 26, 1994, has been disclaimed.

Int. Cl.[2] B01D 53/04

U.S. Cl. 55—33 29 Claims



1. A drying system comprising

a molecular sieve porous bed of synthetic crystalline metal alumino silicate material having an average particle size of about 1 μ to 100 μ, said alumino silicate material consisting essentially of at least one zeolite selected from the group consisting of Type A, Type L, Type X, Type Y and mixtures of said zeolite with one another;

means for contacting the bed in a drying chamber with a fluid to be dried;

means for regenerating the bed including means for applying a 0–10^3 Hz frequency electrical field of at least 0.2 Kv/cm across the bed directly through the zeolite particles to

maintain a current density during regeneration of about 0.01 to 100 microamps/cm^2; and

means for removing water from the bed during regeneration.

4,094,653

PARTICLE CHARGING DEVICE AND AN ELECTRIC DUST COLLECTING APPARATUS MAKING USE OF SAID DEVICE

Senichi Masuda, 40-10-605, 1-chome, Nishigahara Kita-ku, Tokyo, Japan

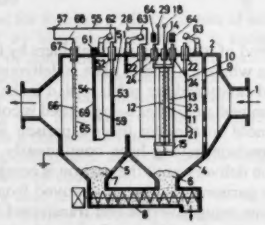
Division of Ser. No. 496,537, Aug. 12, 1974, Pat. No. 3,980,455. This application May 21, 1976, Ser. No. 688,636

Claims priority, application Japan, Sep. 7, 1973, 48-100904; Aug. 14, 1973, 48-91188

The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.^{2} B03C *3/00*

U.S. Cl. 55—138 **5 Claims**



4. A two-stage electric dust collecting apparatus comprising:

a duct having an inlet port for receiving a dust containing gas and a gas outlet port for exhausting cleaned gas;

a particle collecting section in said duct comprising positive and negative electrode groups disposed insulatively from each other in said duct and opposed to each other so as to intercept the gas flow in said duct and a D.C. high voltage source coupled to said electrode groups for applying a D.C. high voltage between said positive and negative electrode groups, and

a particle charging section positioned in said duct and disposed upstream of said particle collecting section and comprising a plurality of discharge electrodes having a relatively small radius of curvature, a plurality of opposite electrodes opposed to and insulatively spaced from said discharge electrode and positioned in said duct in the flow of gases through said duct, third electrodes having a relatively large radius of curvature compared to said discharge electrodes and disposed in the proximity of said discharge electrodes on opposite sides of said discharge electrodes on the upstream and downstream sides of each of said discharge electrodes, each of said discharge, opposite and third electrodes being insulatively mounted in said apparatus to said duct so as to be exposed in a gas flow in said duct, a first high voltage source coupled to said discharge electrodes for applying a periodically varying high voltage of single polarity between said discharge electrode and said third electrode for developing negative ions intermittently, a D.C. voltage bias source coupled to said third electrodes of the same polarity as said single polarity for applying a D.C. bias voltage between said discharge electrodes and said third electrodes and a first D.C. high voltage source coupled to said opposite electrodes of a polarity opposite said single polarity for applying a D.C. high voltage between said opposite electrodes and said third electrodes to continuously provide a steady electrical field between said opposite and said third electrodes.

4,094,654

CABIN FOR AN ELECTROSTATIC POWDER COATING INSTALLATION

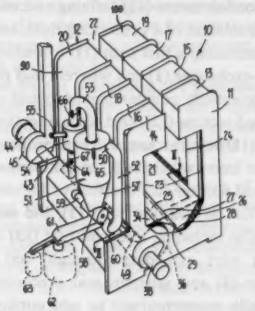
Robert Prinzing, St. Gallen, Switzerland, assignor to Gema AG Apparatebau, St. Gallen, Switzerland

Filed Sep. 10, 1976, Ser. No. 722,134

Claims priority, application Switzerland, Sep. 29, 1975, 12578/75

Int. Cl.^{2} B01D *46/04*

U.S. Cl. 55—290 **9 Claims**



1. A cabin for an electrostatic powder coating installation, comprising in combination, means defining an internal compartment, means defining a chamber, a rotatable hollow filter drum arranged within said chamber, said rotatable filter drum having an axis, an inner side and outer side, guide means defining a slot-shaped opening connecting said internal compartment with said chamber for directing air and oversprayed powder transversely to said filter drum axis, said axis being disposed substantially parallel to said slot-shaped opening, means for rotating the rotatable filter drum about its axis, suction means for subjecting said inner side of the filter drum to the action of a negative pressure and for causing air and oversprayed powder to flow from said internal compartment through said slot-shaped opening into said chamber and to impinge on said outer side of the filter drum, a stationary suction nozzle spanning the outer side of the filter drum along a surface line thereof for removing oversprayed powder therefrom, a suction blower and a separator for connecting the stationary suction nozzle with the suction blower.

4,094,655

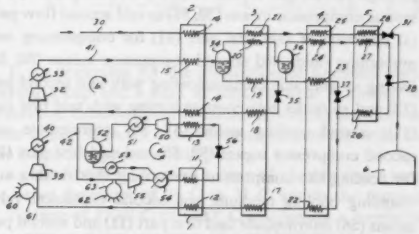
ARRANGEMENT FOR COOLING FLUIDS

Heinrich Krieger, Leitlestrasse 16, 81 Garmisch-Partenkirchen, Germany

Division of Ser. No. 392,812, Aug. 29, 1973, abandoned. This application Apr. 2, 1975, Ser. No. 564,441

Int. Cl.^{2} F25J *1/02*

U.S. Cl. 62—40 **1 Claim**



1. An apparatus for cooling fluids, particularly for liquefying gaseous substances, comprising

I. first conduit means (41) defining a first flow path (b) for the circulatin of a cooling fluid, said first flow path (b) including a first section (15) and including a second section (12) downstream of said first section (15), said second section (12) extending through a first heat-exchanger (1) and second first section (15) extending through a second heat-exchanger (2) that constitutes a first cooling stage, said first and said second heat-exchanger being substantially thermally separated from each other; and

II. second conduit means (42) defining a second flow path (a) for the circulation of a precooling fluid, said second flow path (a) including a first path (11) extending through said first heat-exchanger (1) and wherein said precooling fluid flows substantially countercurrent to said cooling fluid in said second section (12), said second section (12) and said first part (11) being arranged in heat-exchange relationship in the first heat exchanger (1) so that said cooling fluid in said second section (12) is effective for cooling said precooling fluid in said first part (11), and said second flow path (1) also including a second part (13) downstream of said first part extending through said second heat-exchanger (2) and wherein said precooling fluid flows substantially countercurrent to said cooling fluid in said first section (15), said first section (15) and said second part (13) being arranged in heat-exchange relationship in the second heat exchanger (2) so that said precooling fluid in said second part (13) is effective for cooling said cooling fluid in said first section (15),

III. and said apparatus further comprising at least one phase-separator means (34, 36) having a vapor discharge side and a liquid discharge side; and at least one further heat-exchanger (3,4) downstream of said vapor discharge side constituting at least one further cooling stage, said phase-separator means being adapted for separating the liquid and vapor components of said cooling fluid subsequent to its passage through a cooling stage;

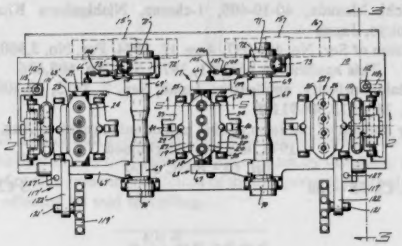
IV. and said apparatus further comprising first compressor means (39, 32) in said first flow path (b) upstream of said first section (15) for compressing said cooling fluid, said first compressor means (39, 32) having an inlet side communicating with said second section (12) and an outlet side communicating with said first section (15); first cooling means (40, 33) intermediate said first compressor means (39, 32) and said first section (15) for cooling the compressed cooling fluid with a surrounding cooling medium; first expansion valve means (37) downstream of said phase-separator means having an inlet side communicating with said liquid discharge side of the latter and an outlet side communicating with said second section (12) via a third section (17) of said first flow path (b) extending through at least one of said further heat-exchangers (3, 4); second compressor means (50, 55) in said second flow path (a) upstream of said first part (11) for compressing said precooling fluid, said second compressor means (50, 55) having an inlet side communicating with said second part (13) and an outlet side communicating with said first part (11); second cooling means (57, 54) intermediate said second compressor means (50, 55) and said first part (11) for cooling the compressed precooling fluid with a surrounding cooling medium; and second expansion valve means (56) intermediate said first part (11) and second part (13) having an inlet side communicating with said first part (11) and an outlet side communicating with said second part (13).

4,094,656

METHOD FOR FORMING GLASS CONTAINERS

Robert D. Colchagoff; Paul W. Fortner, both of Toledo; Richard T. Kirkman, Maumee; Thomas J. Naughton, Toledo, and George Zimmerman, Sylvania, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 7, 1977, Ser. No. 775,131
Int. Cl.[2] C03B 9/26
U.S. Cl. 65—81 **13 Claims**



1. The method of forming glass containers by the "blow and blow" process wherein a gob of glass is delivered to a parison and neck mold cavity and the gob is settled in the neck mold by vacuum and immediately after being settled is counterblown in the parison mold to thereby form a parison with the glass forming the parison having been continuously worked from the time of gob delivery until the parison is completely formed and, with the parison mold being removed from the parison, the parison then being inverted and transferred from the parison forming position to a blow or final mold where the parison is expanded into final form, the improvement comprising:

maintaining a condition of above atmospheric pressure within the interior of the formed parison at a sufficient level to prevent collapse of the parison during the transfer and inversion thereof to the blow or final mold; and

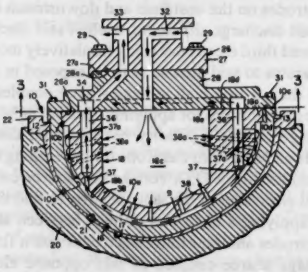
releasing the pressure from the interior of the parison after transfer to the blow mold is completed, whereby a glass container of a given capacity may be formed with less glass, be of more uniform wall thickness and have improved strength.

4,094,657

GLASS PRESSING PLUNGER COOLING

Arieh Carmi, Big Flats; Zung S. Chang, Painted Post, and Thomas J. Rayeski, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 729,409, Oct. 4, 1976, Pat. No. 4,059,429.
This application Jun. 3, 1977, Ser. No. 803,153
Int. Cl.[2] C03B 9/00
U.S. Cl. 65—83 **2 Claims**



1. A method of differentially cooling a plunger for press forming glass articles in a cooperative forming mold, such

plunger having regions of sharp curvatures requiring high heat removal rates joining with regions of lesser curvatures requiring lower heat removal rates than said regions of shape curvatures, such method comprising:

(A) providing in said plunger a cooling fluid plenum chamber,

(B) supplying cooling fluid to said chamber,

(C) dividing said cooling fluid in said chamber and flowing the major portion of such fluid therefrom over said regions of sharp curvatures of said plunger and simultaneously directly flowing the minor portion of the fluid therefrom over said regions of lesser curvatures of the plunger, and

(D) exhausting the spent cooling fluid from said plunger.

4,094,658

FORMING A FALLING CURTAIN OF MOLTEN GLASS

Frank J. Lazet, Media, Pa., assignor to PQ Corporation, Valley Forge, Pa.

Filed Aug. 29, 1977, Ser. No. 828,140

Int. Cl.² C03B *37/06, 17/00*

U.S. Cl. 65—90 **10 Claims**

1. A method for forming a falling curtain of molten material, characterized by becoming viscous as it cools, said falling curtain being of controlled and uniform thickness and of uniform temperature, comprising the steps of:

(a) forming a bed of said molten material;

(b) drawing said material from the bed into a forehearth which has a compound rate of fall;

(c) allowing said molten material to flow through the forehearth, thereby cooling it;

(d) applying heat to the material near the side walls of the forehearth thereby preventing non-uniform cooling of the material; and

(e) allowing the molten material to flow over the lip of the forehearth, thereby forming the desired falling curtain.

4,094,659

PROCESSING OF GLASS SHEETS

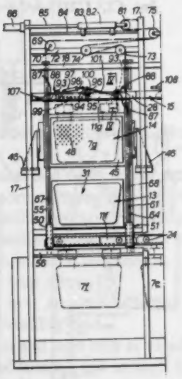
Phillip Sydney Nixon, Skelmersdale, and Harold Woods, Prescot, both of England, assignors to Triplex Safety Glass Company Limited, Birmingham, England

Filed Mar. 15, 1977, Ser. No. 777,837

Claims priority, application United Kingdom, Mar. 17, 1976, 10682/76

Int. Cl.² C03B *35/00*

U.S. Cl. 65—104 **14 Claims**



1. Apparatus for the processing of glass sheets comprising a furnace for heating the glass sheets, a plurality of transport members from each of which transport members a glass sheet is suspended vertically in the furnace, a series of treatment stations for the heated glass sheets positioned vertically one above the other over the furnace, a lifting device associated with said treatment stations and including means for engaging below one of said transport members and lifting that transport member and the heated glass sheet suspended therefrom vertically from the furnace at least into the lowermost one of said treatment stations, and means above said lowermost one of the treatment stations for subsequently supporting the transport member and the suspended glass sheet independently of the lifting device, so that the lifting device can then be lowered to engage below the transport member of a further glass sheet suspended in the furnace for the commencement of the lifting of such further glass sheet from the furnace to said lowermost one of the treatment stations while subsequent processing of said glass sheet is carried out.

11. A method for the processing of a glass sheet comprising the steps of suspending a glass sheet from a transport member in a furnace, heating the glass sheet in the furnace to a temperature suitable for further processing, lifting the transport member with the suspended glass sheet from below vertically from the furnace into a lowermost one of a series of treatment stations which are positioned vertically one above the other, subsequently independently supporting the transport member and the suspended glass sheet at said lowermost one of said treatment stations, lifting the transport member and the suspended glass sheet from said lowermost one of said treatment stations to a higher one of the treatment stations, lifting a further glass sheet from the furnace to said lowermost one of the treatment stations by lifting a transport member from which said further glass sheet is suspended, and commencing processing of said further glass sheet at said lowermost one of the said treatment stations while subsequent processing of the glass sheet is carried out at said higher one of the treatment stations.

4,094,660

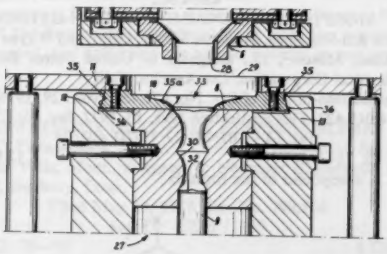
APPARATUS FOR THE PRODUCTION OF STEMMED GLASSWARE

Emil Ilk, 8372 Zwiesel, Ahornweg 4, Germany

Division of Ser. No. 565,573, Apr. 7, 1975, Pat. No. 3,955,954, and a continuation-in-part of Ser. No. 415,640, Nov. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 224,595, Feb. 8, 1972, abandoned. This application May 7, 1976, Ser. No. 684,313

Int. Cl.² C03B *11/02*

U.S. Cl. 65—325 **4 Claims**



1. An apparatus for the production of stemmed glassware having a cup and a stem in which a stem is formed with a transverse cross-sectional dimension intermediate the ends of stem smaller than the cross-sectional dimensions at the ends of the stem, the apparatus comprising:

a glass feeder for feeding a drop of glass having a temperature deviation of 2° C to 3° C within the temperature range of 1100° C to 1200° C and having a weight within plus or minus one gram of a predetermined weight,

a rotatable platen, at least one stem mold carried by said platen and being divided longitudinally and rotatable by said platen into position beneath said glass feeder,

said glass feeder being spaced from said split stem mold through a distance in the range of about 20 mm to 40 mm from the feeder, the glass drop forming a skin and being centered within said divided stem mold,

said platen being rotatable to a pressing station to bring said divided stem mold with the drop therein to said pressing station, a pressing die at said pressing station for pressing the glass drop with a pressure of at about 200 kgs to form the stem in said divided stem mold,

said stem mold being heated to a temperature in the range of about 400° C to 500° C during molding of the stem,

a second rotatable platen positioned above said first platen, a cup forming mold on said second platen having an upper opening and a bottom opening,

transfer means for pushing the stem upwardly from said stem mold and for inverting said stem into bottom opening in said cup forming mold for joining to a cup mold molded in said cup mold.

4,094,661

PLANT GROWTH REGULATORS

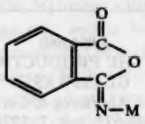
Gerhard H. Alt, Creve Coeur, and John E. Franz, Crestwood, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 536,675, Dec. 26, 1974, Pat. No. 3,985,773. This application Jul. 14, 1976, Ser. No. 705,316

Int. Cl.[2] A01N *9/28*

U.S. Cl. 71—88 **14 Claims**

1. A method of regulating the natural growth or development of plants which comprises applying to the plants or soil a non-lethal amount of compound selected from those having the formula



wherein M is selected from the group of radicals consisting of naphthyl, tolyl, o- and m-monochloro and monobromo and dichloro- and dibromophenyl, o, m-dimethoxyphenyl, and o-chloro- or bromo-m-trifluoromethylphenyl.

4,094,662

MORPHOLINOBENZIMIDAZOLE N-OXIDES

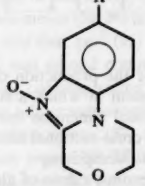
Kelvin Kei-Wei Shen, Fountain Valley, Calif., and Wayne Stuart Belles, Moscow, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 671,452, Mar. 29, 1976, Pat. No. 4,049,422. This application Mar. 10, 1977, Ser. No. 776,395

Int. Cl.[2] A01N *9/22*; C07D *498/04*

U.S. Cl. 71—92 **12 Claims**

1. A compound of the formula



wherein X is a branched-chain alkyl group of 3 to about 6 carbon atoms or trifluoromethyl.

8. The method of controlling undesirable plant growth which comprises applying a phytotoxic amount of a compound according to claim 1 to the locus of said plants.

4,094,663

QUADRICYCLIC MORPHOLINOBENZIMIDAZOLE COMPOUNDS

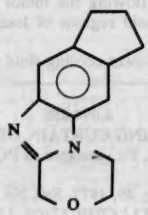
Kelvin Kei-Wei Shen, Fountain Valley, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Sep. 12, 1977, Ser. No. 832,137

Int. Cl.[2] C07D *498/04*; A01N *9/22*

U.S. Cl. 71—92 **10 Claims**

1. A compound of the formula



and the N-oxide derivative thereof.

6. The method for controlling weed growth which comprises applying to the locus of said weeds a phytotoxic amount of a compound according to claim 1.

4,094,664

PLANT GROWTH REGULATING AGENTS

Gareth John Thomas, Hitchin, England, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 4, 1976, Ser. No. 655,301

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—115 **4 Claims**

1. A method for regulating the growth of plants which comprises applying to the plants, as the active ingredient, an amount of 6-amino-o-toluic acid or an agriculturally acceptable salt thereof which is effective in regulating plant growth.

4,094,665

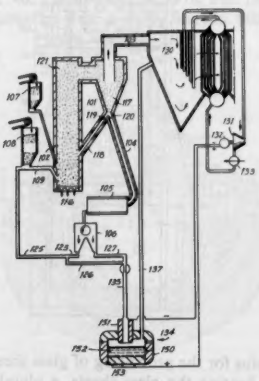
METHOD FOR SIMULTANEOUS COMBINED PRODUCTION OF ELECTRICAL ENERGY AND CRUDE IRON

Per Harald Collin, Falun, and Bjorn Widell, Vasteras, both of Sweden, assignors to Stora Kopparbergs Bergslags AB, Falun, Sweden

Filed May 13, 1977, Ser. No. 796,658

Int. Cl.[2] C21C *5/52*

U.S. Cl. 75—11 **3 Claims**



1. In a method for production of crude iron from iron oxide and carbonaceous materials wherein electricity is generated as

part of the crude iron production and said generated electricity is reutilized in said production of crude iron, the improvement comprising:

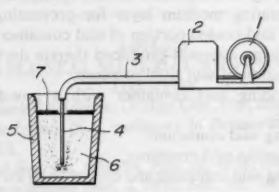
maintaining a fast fluidized bed of solid fine-grained carbonaceous material and iron oxide, continuously adding iron oxide and carbonaceous material to said fluidized bed, continuously adding an oxygen-containing gas to said fluidized bed, maintaining in said fluidized bed a temperature high enough to react the oxygen of said oxygen-containing gas with the carbonaceous material to produce a reducing gas, withdrawing reducing gas and solid particles of partially reduced iron oxide and carbonaceous material from the top of the fluidized bed, separating said reducing gas from said solid particles, conveying at least part of said separated solid particles to the fluidized bed at a level between its top and bottom, burning said separated reducing gas in a combustion zone to produce heat, converting said heat into direct current electricity, withdrawing from the fluidized bed carbonaceous material and iron oxide having been partially reduced to a metallization degree of 30–80 percent, maintaining a pool of molten crude iron by maintaining a temperature sufficient to keep molten crude iron in said pool by having a direct current electric arc between a tubular electrode and the surface of the pool, feeding said electric arc with said direct current electricity, conveying the iron oxide, having a metallization degree of 30–80 percent, and at least part of the accompanying carbonaceous material to said pool through said tubular electrode and said direct current electric arc, and burning the gas produced in said pool in said combustion zone to add to the production of electricity.

4,094,666

METHOD FOR REFINING MOLTEN IRON AND STEELS

Tohei Ototani, Tokyo, Japan, assignor to Metal Research Corporation, Tokyo, Japan

Filed May 24, 1977, Ser. No. 800,140
Int. Cl.² C21C *7/02*
U.S. Cl. 75—58 **5 Claims**



1. A method for refining molten iron and steel bath comprising,

feeding a compressed and deformed composite clad material of a solidified core encassed in a sheath in wire and rod form having a sufficient rigidity obtained by

clading a core consisting essentially of at least one element of metallic calcium, metallic magnesium, calcium base alloys and magnesium base alloys,

with a sheath of iron and mechanically compressing and deforming the resulting clad,

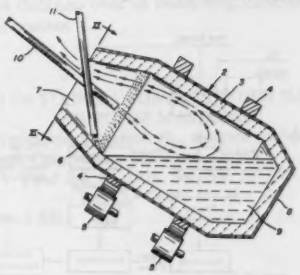
into the molten iron and steel bath at a feeding rate of 20–500 m/min, a rate of feeding fast enough to avoid forming a fume or a flame of calcium or magnesium, whereby substantially 100% of the added calcium or magnesium is effectively reacted with said molten iron and steel bath, while deoxidizing, desulfurizing, spherodizing of graphite and inoculating said molten iron and steel bath are effectvely carried out.

4,094,667

MELTING OF FINE PARTICULATE MATERIAL IN A HIGH-SPEED ROTARY FURNACE

Louis H. Jaquay, Pittsburgh, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jan. 31, 1977, Ser. No. 764,083
Int. Cl.² C22B *5/02*
U.S. Cl. 75—92 **5 Claims**



1. The method of melting finely divided particulate material in a rotary furnace with a refractory lining and with opposed ends, one of which is open, said furnace and lining being arranged to collect and retain a pool of molten metal during operation of the furnace of maximum depth near one end and diminishing depth extending toward said open end but terminating within the furnace between the place of maximum depth and before reaching said open end whereby there is an area of the refractory lining between the pool and the open end beyond which the said pool of molten metal extends and which is continuously exposed to the atmosphere within the furnace, the steps comprising:

(a) continuously depositing the particulate material from a feed pipe which enters the open end of the furnace onto the refractory lining at the furnace at the low point of revolution of the refractory lining which it is revolving and between the pool of molten metal and said open end;

(b) projecting burning gases within the furnace from burner means at the open end of the furnace at a level above the place of discharge of the particulate material onto the refractory wall and said place of discharge being out of the direct path of the outflow of said gases through the open end of said furnace wall; and

(c) retaining the particulate material on the refractory lining of the furnace by centrifugal force until the material is melted, and collecting the melted material in said pool.

4,094,668

TREATMENT OF COPPER REFINERY SLIMES

John C. Yannopoulos, Danbury, Conn., and Borham M. Borham, Great Falls, Mont., assignors to Newmont Exploration Limited, Danbury, Conn.

Filed May 19, 1977, Ser. No. 798,564
Int. Cl.² C22B *11/00*
U.S. Cl. 75—99 **4 Claims**

1. Process for the recovery of gold, silver and selenium from copper refinery slimes containing these metals which comprises:

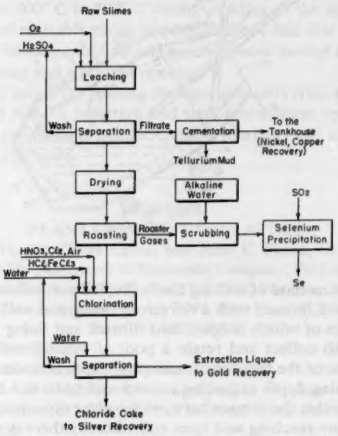
treating the raw slimes with a dilute solution of sulfuric acid at a temperature of between about 40° and 100° C. and at a partial pressure of oxygen of between about 5 to 50 lbs. per square inch gauge to obtain a leach solution containing at least about 98% by weight of the copper content of the raw slimes and to obtain a decopperized leach residue containing the gold, silver and selenium content of the raw slimes,

roasting the leach residue in an oxidizing atmosphere at a temperature of about 400° to 800° C. for at least about 4 hours to obtain effluent roaster gases containing the sele-

nium content of the raw slimes in the form of selenium dioxide and to obtain a deselenized roaster residue containing the gold and silver content of the raw slimes,

treating the effluent roaster gases to recover the selenium dioxide content thereof,

adding dilute hydrochloric acid or nitric acid and ferric chloride to the roaster residue to obtain a slurry containing about 20% by weight solids, and continuously bubbling chlorine and air through the slurry at a temperature



of between about 25° to 90° C. for a period of at least about 5 hours to obtain an extraction liquor containing the gold and residual selenium content of the raw slimes and a solid chlorination residue containing the silver content of the raw slimes,

separating the chlorination extraction liquor from the solid chlorination residue, treating said extraction liquor to recover the gold content thereof and treating said chlorination residue to recover the silver content thereof.

4,094,669

POLYTETRAFLUOROETHYLENE MEMBRANE FILTERS FOR MERCURY RECOVERY

Edward Nicholas Balko, Trenton, and Shyam Dattatreya Argade, Woodhaven, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 2, 1976, Ser. No. 645,969
Int. Cl.[2] B01D *13/00*; C22B *43/00*
U.S. Cl. 75—108 **11 Claims**

6. The process of claim 1 wherein the reducing agent is sodium borohydride.

4,094,670

WEATHERING STEEL WITH HIGH TOUGHNESS

Roberto Bruno, and Valerio Faccenda, both of Rome, Italy, assignors to Italsider S.p.A., Italy

Continuation of Ser. No. 514,780, Oct. 15, 1974, abandoned. This application Jul. 1, 1977, Ser. No. 812,391
Claims priority, application Italy, Oct. 15, 1973, 53141 A/73
Int. Cl.[2] C22C *38/06, 38/16, 38/20*
U.S. Cl. 75—124 **2 Claims**

1. A weathering steel consisting essentially of the following percent composition by weight:

C 0.05 - 0.15
Mn 0.5 - 1.5
Cu 0.2 - 0.5
Al 0.2 - 0.5
Si 0.0 - 0.8
Cr 0.1 - 1.5
S up to 0.02
P up to 0.04
Nb up to 0.020
N up to 0.010
Mo up to 0.15
Ti up to 0.1

balance essentially iron, the manganese, copper, chromium, aluminum and niobium having the following weight relationship: 2.6(Mn%) + 3.2(Cu%) + 41.6(Nb%) + 1.3(Cr%/Al%) = 7.4 to 10.1 the weight ratio of chromium to aluminum being from 2 to 5.

4,094,671

GOLD COLOR COPPER ALLOY FOR RESTORATIVE DENTISTRY

Osamu Hayashi, No. 26-6, Okusawa 2-chome, Setagaya-ku, Tokyo-to, Japan

Filed Jul. 12, 1976, Ser. No. 704,553
Claims priority, application Japan, May 7, 1976, 51-51851
Int. Cl.[2] A61C *13/00*; C22C *9/04*
U.S. Cl. 75—157.5 **7 Claims**

1. A gold color dental restoration formed of a copper alloy consisting essentially by weight of 48–52% of copper, 47–51% of zinc and 0.1–1.0% of zirconium, said dental restoration being chemically stable against discoloration and dissolution in the mouth in which it is applied.

4,094,672

METHOD AND CONTAINER FOR HOT ISOSTATIC COMPACTING

James N. Fleck, Pittsburgh, Pa.; Richard C. Palmer, East Liverpool, Ohio, and Charles L. Ruffner, Pittsburgh, Pa., assignors to Crucible Inc., Pittsburgh, Pa.

Filed Dec. 22, 1975, Ser. No. 642,976
Int. Cl.[2] B22F *3/00*
U.S. Cl. 75—226 **2 Claims**

1. A method for isostatically compacting powder metallurgy charges by the application of fluid pressure by:

(a) providing a cylindrical, metal container having a cylindrical body portion closed at each end by a generally disc-shaped end plate,

(b) applying to the interior of said cylindrical body portion a separating medium layer for preventing bonding between said coated portion of said container and a powder metallurgy compact produced therein during subsequent application of said fluid pressure,

(c) providing said container with a powder metallurgy charge,

(d) sealing said container,

(e) outgassing said container,

(f) heating said container and charge to an elevated temperature,

(g) applying fluid pressure to the exterior of said heated container to isostatically compact with charge therein to produce a powder metallurgy compact, and

(h) releasing said pressure and cooling said container and compact,

the improvement comprising:

(i) removing at least one end plate from said container, including all end plates not coated with said separating-medium layer,

(j) introducing to the interior of said container a fluid under pressure sufficient to cause said container to move away from said compact, and

(k) removing said compact from said container by withdrawing said compact through an end from which any said end plate has been removed,

whereby the cylindrical body portion of said container is preserved for reuse.

2. A method for isostatically compacting powder metallurgy charges by the application of fluid pressure to produce a tubular compact by:

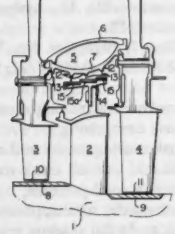
(a) providing a cylindrical, metal container having a cylindrical body portion closed at each end by a generally disc-shaped end plate,
(b) applying to the interior of said cylindrical body portion a separating medium layer for preventing bonding between said coated portion of said container and a powder metallurgy compact produced therein during subsequent application of said fluid pressure,
(c) providing said container with a powder metallurgy charge,
(d) sealing said container,
(e) outgassing said container,
(f) heating said container and charge to an elevated temperature,
(g) applying fluid pressure to the exterior of said heated container to isostatically compact said charge therein to produce a powder metallurgy compact, and
(h) releasing said pressure and cooling said container and compact,
the improvement comprising:
(i) axially positioning within said container a metal sleeve substantially coextensive with said container and having an outside diameter less than the inside diameter of said container to define an annular passage between said sleeve and said container,
(j) said powder metallurgy charge being provided within said annular passage,
(k) applying to the exterior of said sleeve a separating medium layer for preventing bonding between said sleeve and a powder metallurgy compact produced within said container during subsequent application of said fluid pressure,
(l) providing an opening in said end plates communicating with the interior of said sleeve,
(m) removing at least one end plate from said container, including all end plates not coated with said separating-medium layer,
(n) introducing to the interior of said container a fluid under pressure sufficient to cause said container and said sleeve to move away from said compact, and
(o) removing said compact from said container by withdrawing said compact through an end from which said end plate has been removed,
whereby the cylindrical body portion of said container and said sleeve are preserved for further use.

4,094,673

ABRADABLE SEAL MATERIAL AND COMPOSITION THEREOF

Arnold Roderick Erickson, Orange City, Fla., and Carlino Panzera, Belle Mead, N.J., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 440,794, Feb. 28, 1974, abandoned. This application Nov. 2, 1976, Ser. No. 737,505
Int. Cl.[2] B22F *5/00*
U.S. Cl. 75—246 **6 Claims**



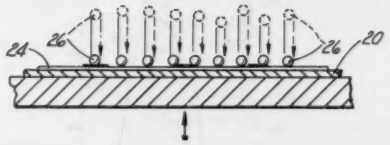
1. A porous metal mat or compact resistant to oxidation at high temperatures comprising:
(a) a sintered mass of fine metal particles composed of a homogenous alloy consisting essentially of the composition I, Cr, Al and Si, wherein I is at least one member of the group consisting of Fe, Co, Ni, and mixtures of Co and Ni;
(b) the components of the alloy having essentially the following weight percents: 10–27% Cr, not more than 20% Al, 0.1–2.0% Si, and, I = the remainder;
(c) the exposed surface of the particles being capable of developing a protective coating of Al_2O_3 at least 0.5 micron in thickness over an underlying substrate of at least 4% Al content.

4,094,674

METHOD OF FIXING A TONER POWDER IMAGE ON A SHEET OF MATERIAL

James P. Valancius, Elmhurst, Ill., assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed Jul. 22, 1976, Ser. No. 707,773
Int. Cl.[2] G03G *13/20*
U.S. Cl. 96—1 SD **6 Claims**



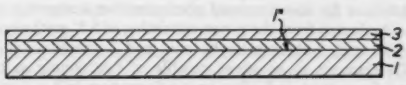
1. A method of fixing to a sheet of paper a toner powder image applied to a first side thereof comprising the steps of:
providing an impact member having a hard smooth impact surface;
placing the side of the sheet of paper which is opposite to the first side into contact with said impact surface;
providing a plurality of compact, hard surfaced pellets each of which has an impacting area which is substantially smaller than that area of said sheet of paper carrying the toner powder image;
imparting kinetic energy to the pellets; and
impacting the first side of said sheet of paper with the thus energized pellets to pressure fix the toner powder image thereto.

4,094,675

VAPOR DEPOSITION OF PHOTOCONDUCTIVE SELENIUM ONTO A METALLIC SUBSTRATE HAVING A MOLTEN METAL COATING AS BONDING LAYER

Hans-Hermann Beschoner, Bad Westernkotten; Gottfried Guder, Belecke; Hartmut Dulken, Belecke, and Karl-Heinz Kassel, Belecke, all of Germany, assignors to LICENTIA Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Jul. 17, 1974, Ser. No. 489,440
Claims priority, application Germany, Jul. 23, 1973, 2337386; Jul. 23, 1973, 7326993
Int. Cl.[2] G03G *5/04*; C25D *5/00*; C23C *13/02*
U.S. Cl. 96—1.5 **9 Claims**



1. A method of making an electrophotographic image carrier, comprising the fol'owing steps:
(a) applying an intermediate layer on a electrically conductive substrate; the material of said intermediate layer being selected from the group consisting of indium, gallium, bismuth, lead, tin, cadmium, the alloys thereof and sul-

phur; said alloys consisting essentially of the elements constituting members of said group;

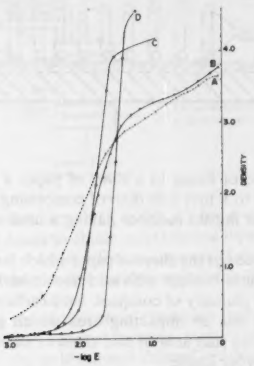
(b) subsequent to step (a), vapor-depositing an amorphous inorganic photoconductive layer made of selenium, a selenium alloy or a selenium compound, on said intermediate layer; and

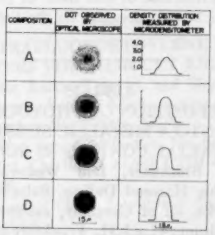
(c) at least at the beginning of step (b), maintaining the temperature of the substrate at a value which is above the melting point of the material of the intermediate layer and below the damaging temperature of the material of the photoconductive layer.

4,094,676
NON-SILVER SALT TYPE PHOTOSENSITIVE COMPOSITION

Hiroshi Takano, Gotenba; Masatsugu Yoshino, Numazu; Hiroshi Naka, Yokohama; Yoshinobu Ito, and Tadao Matsushika, both of Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Feb. 14, 1977, Ser. No. 768,507
Claims priority, application Japan, Feb. 16, 1976, 51-5114938
Int. Cl.[2] G03C *1/52*
U.S. Cl. 96—90 R **7 Claims**





1. A non-silver salt type photosensitive composition which comprises (A) N,N'-diphenyl-p-phenylenediamine and tetramethylthiuram disulfide as a color developing agent, (B) an organic halide compound as a photoactivator liberating therefrom a free radical upon light irradiation, (C) as a storage stabilizer for an unexposed photosensitive material a salicylic acid selected from the group consisting of 5,5'-methylenedisalicylic acid, 5-chlorosalicylic acid and 3-phenylsalicylic acid, (D) thiourea as an agent capable of functioning as both an anti-foggant at and after image formation and a contrasting agent, and (E) at least one member selected from the group consisting of (i) 2-methylindole, (ii) 2-mercaptothiazoline and (iii) p-diethylaminobenzaldehyde as a color tone adjusting agent, the weight amount ratio of the N,N'-diphenyl-p-phenylenediamine to the tetramethylthiuram disulfide ranging from 1:10 to 10:1, the weight amount ratio of said color developing agent to said organic halide compound being 1:20 – 2:1, the weight amount ratio of said color developing agent to said salicylic acid being 2:1 to 1000:1, the weight amount ratio of said color developing agent to the thiourea being 2:1 to 1000:1 and the weight amount ratio of said color developing agent to said color tone adjusting agent being 1:1 to 200:1.

4,094,677
CHEMICAL FABRICATION OF OVERHANGING LEDGES AND REFLECTION GRATINGS FOR SURFACE WAVE DEVICES

Donald F. Weirauch, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,475
Int. Cl.[2] G03C *5/00*
U.S. Cl. 96—36 **2 Claims**

1. A method of etching a surface of a substrate to be employed in an acoustic surface wave device, wherein the pattern to be etched into the substrate surface produces an overhanging ledge structure and the substrate is made of a piezoelectric material of ST cut α quartz, said method comprising:

chemically polishing the surface of the substrate by applying a chemical mixture to the substrate surface effective to remove amorphous material from the substrate surface for providing a polished crystalline finish to the substrate surface,

applying a layer of chromium over the polished substrate surface,

applying a layer of gold over the chromium layer,

applying a layer of photoresist material over the gold layer,

photographically exposing the layer of photoresist material to a pattern of a desired image wherein the pattern is oriented so that its major axis is perpendicular to a line which falls within boundaries estabished by a first line making an angle of 30° with the −X axis of the crystal lattice of said ST cut α quartz material and another line making an angle of 40° with the +X axis of the said crystal lattice,

developing the photoresist layer to produce the pattern therein,

etching the pattern into the gold layer from the patterned photoresist layer,

etching the pattern into the chromium layer,

etching the pattern into said substrate surface by immersing the substrate surface with the patterned layers of chromium and gold thereon in a solution of hydrofluoric acid maintained at a temperature of approximately 25° C,

removing the etched substrate surface with the patterned layers of chromium and gold thereon from the solution of hydrofluoric acid, and

stripping off the patterned layers of gold and chromium from the etched substrate surface.

4,094,678
METHOD OF MAKING CURVED COLOR CATHODE RAY TUBE SHADOW MASKS HAVING INTERREGISTRABLE ELECTRON BEAM-PASSING APERTURE PATTERNS

Kazimir Palac, Carpentersville, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 7, 1976, Ser. No. 748,802
Int. Cl.[2] G03C *5/00*; B44C *1/22*; C23F *1/00*
U.S. Cl. 96—36.1 **10 Claims**

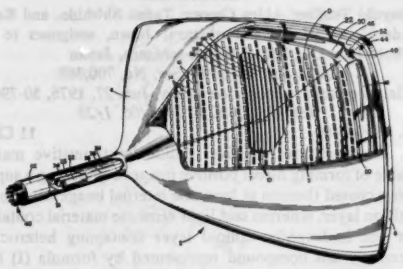
1. An improved method of making a curved color cathode ray tube shadow mask comprising:

providing flat mask master means and curved mask master means, said flat and curved mask master means having correlative master stencil patterns;

using said flat mask master means, photochemically forming in at least one side of a flat shadow mask blank a pattern of blind mask apertures whose individual blind aperture location is related to the end-product mask aperture location and whose individual blind aperture size, at least in a

direction corresponding to the direction of electron beam scan across the mask is greater than the desired end product mask aperture size by a predetermined misregister tolerance value;

precision-shaping said flat mask blank into a predetermined three-dimensional configuration with the said pattern of blind apertures referenced to indexing means defined by the mask blank; and



photochemically etching in the blank a pattern of through apertures coincident with said pattern of blind apertures but having individual through aperture size smaller by said predetermined tolerance value, at least in said scan direction, than said blind apertures, including using said curved mask master means as a photographic stencil while referencing it to said indexing means defined by the mask blank.

4,094,679

PROCESS FOR REDUCING HALFTONE DOT IMAGES

Yasuo Washizawa, and Tomoaki Ikeda, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed Feb. 7, 1977, Ser. No. 766,282
Claims priority, application Japan, Feb. 16, 1976, 51-16305
Int. Cl.[2] G03F 7/10
U.S. Cl. 96—36.3 **15 Claims**

1. A process for reducing the size of the dots of a halftone dot image comprising:

(1) imagewise exposing, using active radiation, a metal image-forming material comprising (a) a support, (b) a thin metallic layer comprised mainly of aluminum on said support, which thin metallic layer is dissolved in the alkaline developer solution of step (2), and (c) a photosensitive resin layer on said thin metallic layer, which photosensitive resin layer is dissolved or swollen and selectively removed at exposed or unexposed areas by contact with the alkaline developer solution of step (2);

(2) developing said image-wise exposed metal image-forming material with an alkaline developer solution to cause the dissolving of the thin metallic layer and the dissolving or swelling and selective removal of the photosensitive resin layer, a half-tone dot image resulting upon development of the photosensitive resin layer;

(3) applying a solution which is effective only to swell the photosensitive resin layer but which at most has only a slight capability to etch the halftone dot image at those parts of said metal image-forming material in which the size of the halftone dots is to be reduced, thereby swelling the photosensitive resin; and then

(4) applying to said metal image-forming material a reducing solution which reduces the size of said dots comprising the half-tone image, the reducing solution permeating between the support and the photosensitive resin layer to contact the thin metallic layer at sites where the thin metallic layer does not contact the photosensitive resin layer or the support and etching the thin metallic layer.

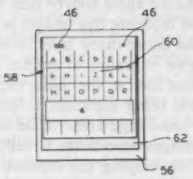
2. The process of claim 1, wherein the solution effective only to swell the photosensitive resin layer is an alkaline aqueous solution having a pH of at least about 9 but below about 11, an organic solvent selected from the group consisting of alcohols and hydroxyethers, or an alkaline aqueous solution with a pH of less than about 11 containing an organic solvent selected from the group consisting of alcohols and hydroxyethers.

4,094,680

METHOD AND APPARATUS OF CHANGING CHARACTERS ON A FONT AND PREPARING A FONT DUPLICATE

Clifford John Frazier, Wilmette, Ill., assignor to Castcraft Industries, Inc., Chicago, Ill.

Filed Jan. 19, 1977, Ser. No. 760,563
Int. Cl.[2] G03C 5/04
U.S. Cl. 96—41 **5 Claims**



1. A method for altering an image including one or more characters located anywhere on a first negative film matrix, under controlled conditions, comprising the steps of:

a. exposing the first negative film matrix on film to produce a first positive film matrix which is an exact duplicate;

b. exposing the first positive film matrix on film to produce a second negative film matrix;

c. overlaying a grid on the first positive film matrix;

d. overlaying a light transparent sheet over said grid;

e. positioning and mounting a replacing image on the light transparent sheet within the desired cell of said grid over the image to be replaced;

f. exposing the mounted replacing image on film to produce a third negative film matrix;

g. covering the image to be replaced on the second negative film matrix with a photographically opaque substance;

h. double exposing both the second and third negative film matrices on the same film to produce a second positive film matrix;

i. exposing the second positive film matrix to produce a fourth negative film matrix which has the replacing image in the position of the replaced image.

3. A method for reproducing and altering a first film matrix having images including one or more characters located anywhere thereon, comprising the steps of:

a. mounting said first film matrix on a jig;

b. mounting a positioning guide having cells of the approximate size of a single character on said jig over said first film matrix;

c. mounting a light transparent sheet on said jig over said positioning;

d. aligning a replacing image within one or more cells of said positioning guide in the desired location over said first film matrix and fixing said replacing image to said light transparent sheet; and

e. double exposing said replacing image and said first film matrix on film to produce a film matrix which includes said replacing image inserted precisely in the desired location with respect to the other images on said first film matrix.

4,094,681

IMAGE AMPLIFICATION OF NEGATIVE-WORKING DIAZO MATERIALS

David P. Habib, East Greenwich, and Gilbert Zweig, Barrington, both of R.I., assignors to Trans World Technology Laboratories, Inc., Fiskeville, R.I.

Filed Oct. 23, 1975, Ser. No. 625,042
Int. Cl.[2] G03C 5/34, 5/18, 5/20
U.S. Cl. 96—49 17 Claims

1. A method for the amplification of dye images formed in a negative-working diazo material having a support and a negative-working acid stabilized diazo layer thereon wherein, on continued exposure to actinic radiation, the diazo compound goes through a photolytic transition starting with an unreactable or non-coupling state, to a reactable state, and finally to an unreactable state, the steps of image formation and amplification which comprise: (1) initially image-wise exposing the negative-working diazo layer to actinic radiation sufficient to convert a portion of the diazo compound contained therein to an active coupling constituent in the light-struck areas to form a first latent image, (2) developing the exposed diazo layer by means of an alkaline agent and/or heat to effect coupling so as to form colored incipient dye images in the light-struck areas, (3) exposing the entire diazo layer from the same side as the initial image-wise exposure to actinic radiation of a greater amount than that used in the initial exposure, said amount of actinic radiation being sufficient to substantially completely photolyze the non-image areas while simultaneously creating second latent images beneath the already-developed dye image areas, and (4) developing the exposed diazo layer again by means of an alkaline agent and/or heat to effect coupling in said second latent image areas to form color therein and to amplify the initial colored incipient dye images.

4,094,682

METHOD FOR PROCESSING LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Mitsuto Fujiwhara; Syunji Matsuo; Toyoaki Masukawa; Mikio Kawasaki, and Yutaka Kaneko, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Hino, Japan

Filed Oct. 20, 1976, Ser. No. 734,271
Claims priority, application Japan, Oct. 24, 1975, 50-127936
Int. Cl.[2] G03C 7/00, 7/16, 5/32
U.S. Cl. 96—55 3 Claims

1. An improved method for processing an imagewise exposed light-sensitive silver halide photographic material containing a coupler, wherein the silver halide photographic material is processed with a developing bath and thereafter processed, in the presence of imagewise developed silver and a color developing agent, with a solution containing hydrogen peroxide, the improvement comprising processing, after the development, the developed light-sensitive silver halide photographic material with a solution containing a deactivating agent capable of being adsorbed on silver halide or reacting with silver to form sparingly soluble silver salts and selected from the group consisting of 2-mercaptobenzimidazole, 2-mercaptobenzothiazole, 2-mercapto-5-nitrobenzothiazole, 4-methyl-2-mercaptothiazole, 4,5-dimethyl-2-mercaptothiazole, 1-phenyl-5-mercaptotetrazole, 1,2-dimethyl-5-mercapto-1,3,4-triazole, 2-mercapto-5-phenyl-1,3,4- oxadiazole, mercaptoacetic acid, β-mercaptopropionic acid, thiosalicylic acid, benzotriazole, 5-nitrobenzimidazole, 5-methylbenzotriazole, 4-chlorobenzotriazole, 5,5-diphenylhydantoin, 2-methyl-3-(γ-sulfoxypropyl) benzoselenazole, 3-methylbenzothiazole toluenesulfonate, N-isopropyl-α-picolinium bromide, N-ethyl-2-methylbenzothiazolium chloride, phenosafranine, pinakryptol yellow 1,1',3,3,3',3'-hexamethyl-5,5-dinitroimidocarbocyanine-p-toluenesulfonate, 1,3-diallyl-2-[(3,5-dimethyl-1-phenyl-4-pyrazolyl)-vinyl]-imidazo-[4,5-b]-quinoxalium iodide, benzyladenine, 8-hydroxyquinoline, o-phenanthroline and thiosugar, and thereafter subjecting the thus processed light-sensitive silver halide photographic material to spraying with and/or intermittent dipping in said solution containing hydrogen peroxide.

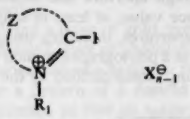
4,094,683

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Nobuyuki Tsujino; Akira Ogawa; Tadao Shishido, and Keiichi Adachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 28, 1976, Ser. No. 700,365
Claims priority, application Japan, Jun. 27, 1975, 50-79893
Int. Cl.[2] G03C 5/24, 1/06, 1/28
U.S. Cl. 96—95 11 Claims

1. A direct positive silver halide light-sensitive material capable of forming direct positive images comprising a support having coated thereon at least one internal image silver halide emulsion layer, wherein said light-sensitive material contains at least one hydrophilic colloid layer containing heterocyclic quaternary salt compound represented by formula (I) in an amount of about 5mg to about 1000mg per 1 mol of silver halide sufficient so that said compound acts as a fogging agent in the silver halide photographic emulsion



(I)

wherein Z is an atomic group necessary for completing a 5- or 6-membered heterocyclic nucleus selected from the group consisting of a thiazole nucleus, a benzothiazole nucleus, a naphthothiazole nucleus, a selenazole nucleus, a benzoselenazole nucleus, a naphthoselenozole nucleus, an oxazole nucleus, a benzoxazole nucleus, a naphthoxazole nucleus, a benzimidazole nucleus, a pyridine nucleus, a quinoline nucleus and an indolenine nucleus, R_1 is an aliphatic group, having 1 to 8 carbon atoms, which aliphatic group is selected from the group consisting of an unsubstituted alkyl group, a sulfo substituted alkyl group, a sulfoalkoxyalkyl group, a hydroxysulfoalkyl group, a carboxyalkyl group, a hydroxyalkyl group, an alkoxyalkyl group, an acyloxyalkyl group, a dialkylaminoalkyl group, a sulfatoalkyl group, an aralkyl group, and a vinylmethyl group, R_2 is a hydrazonoalkyl group having 1 to 8 carbon atoms in the alkyl moiety thereof, $X\ominus$ is an anion, and n is 1 or 2, when n is 1 the compound forms an intermolecular salt.

4,094,684

PHOTOGRAPHIC EMULSIONS AND ELEMENTS CONTAINING AGEL CRYSTALS FORMING EPITAXIAL JUNCTIONS WITH AGI CRYSTALS

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 18, 1977, Ser. No. 770,241
Int. Cl.[2] G03C 1/02, 1/28
U.S. Cl. 96—108 20 Claims

1. A photographic emulsion comprised of a photographic vehicle as a continuous phase and, as a discrete phase, radiation-sensitive composite silver halide crystals comprised of

multi-faceted, radiation-receptive silver iodide crystals having a minimum mean diameter of at least 0.1 micron,

silver chloride crystals forming epitaxial junctions with the silver iodide crystals,

at least half of the facets of the silver iodide crystals being substantially free of epitaxial silver chloride, and

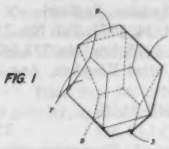


FIG. 1

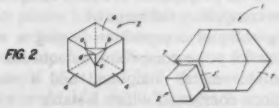


FIG. 2

FIG. 4

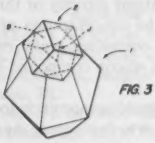


FIG. 3

silver chloride being limited to less than 75 mole percent, based on the total silver halide forming said composite crystals.

4,094,685

EXPANDABLE POLYMERIC COATING COMPOSITIONS

David Lester, Arlington, and Robert R. Alexander, Waltham, both of Mass., assignors to Polymerics, Inc., Waltham, Mass.

Filed Jul. 23, 1976, Ser. No. 708,167

Int. Cl.[2] C08J *9/14*

U.S. Cl. 260—2.5 B **26 Claims**

1. An expandable polymeric coating composition for admixture with paints, dyes and inks to form an expandable chemical coating upon the application of heat comprising:

a first forming binder polymer latex normally in the form of a polymeric dispersion in water to serve as a binder for said composition;

a dispersing agent to serve as a dispersant for expandable volatile substances encapsulated in a monomeric film forming polymer;

a plurality of spheres each of which encapsulates at least one expandable volatile substance in a monomeric film forming polymer dispersed within said first film forming binder polymer latex;

a defoaming agent to prevent excessive foaming when heat is applied to said spheres;

a bridge solvent to provide compatability with the substance into which said polymeric compositions will be mixed and to provide a wetting of said spheres to provide a homogeneous mixture;

a thickener to increase the viscosity of the composition to the desired level, to give stability to mixtures and to give suspending action to said spheres.

4,094,686

ROAD-SURFACE ADDITIVE FOR PREVENTING ICE AND MELTING SNOW

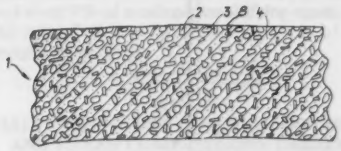
Robert Dubois, La Croix, Lutry, Switzerland, assignor to Plastiroute S.A., Switzerland

Continuation-in-part of Ser. No. 477,338, Jun. 7, 1974, Pat. No. 4,012,537. This application Nov. 24, 1976, Ser. No. 744,758

Claims priority, application Switzerland, Nov. 25, 1975, 15242/75

Int. Cl.[2] C09K *3/18*

U.S. Cl. 106—13 **8 Claims**



1. A road surface additive for incorporation in an asphalt or bituminous based road surface layer, comprising a mixture of discrete particles of a halide selected from the group consisting of calcium, magnesium and sodium chlorides and mixtures thereof and an alkali metal hydroxide selected from the group of sodium and potassium hydroxides in the ratio of 90 to 97 parts by weight of halide for 3 to 10 parts of hydroxide, said particles having substantially water-tight coatings which are inert to the halide and hydroxide and heat resistant at temperatures to which the admixed additive may be subjected for formation of a road surface layer and which coatings can be mechanically destroyed to expose said particles at the surface of a road incorporating the additive to prevent ice formation and melt snow on said surface.

4,094,687

HEAT-SENSITIVE RECORDING COMPOSITION

William R. Lawton, 6651 Jewett-Holmwood Rd., Orchard Park, N.Y. 14127

Continuation-in-part of Ser. No. 772,084, Feb. 25, 1977, and Ser. No. 774,210, Mar. 3, 1977, and Ser. No. 774,385, Mar. 4, 1977. This application Mar. 4, 1977, Ser. No. 774,330

Int. Cl.[2] C09D *11/00*; G03C *1/52*

U.S. Cl. 106—21 **5 Claims**

1. A heat-sensitive, non-volatile, non-hygroscopic, and odor-free recording composition adapted to acquire a color contrasting visibly with a background color of the composition upon heating a selected region thereof to an elevated temperature, comprising

an N-substituted condensation product of a heterocyclic diimino compound and an aromatic aldehyde, said heterocyclic diimino compound being selected from the group consisting of piperazine, homopiperazine, 2-methylpiperazine, and 2,5-dimethyl piperazine and

a cyclic polyketo compound reactive with amines and amides at elevated temperatures to form a color, said cyclic polyketo compound being selected from the group consisting of ninhydrin, isatin, 5-bromoisatin, 5,7-dichloroisatin, 5-nitroisatin, alloxan, alloxazine, and hydrindantin.

4,094,688

METHOD AND MOLDING CORE FOR MAKING A FLEXIBLE HOLLOW MOLDED BODY WHICH IS OPEN ON A NUMBER OF SIDES

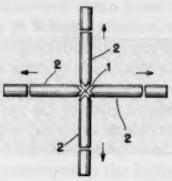
Franz-Josef Wolf, Sprudelallee 19, -6483 Bad Soden-Salmunster, Germany

Filed Apr. 30, 1976, Ser. No. 682,089

Claims priority, application Japan, Aug. 21, 1975, 2537251; Germany, Feb. 18, 1976, 2606528

Int. Cl.[2] B28B *7/36;* B29C *1/12*

U.S. Cl. 106—38.2 10 Claims



1. A method for making a flexible pipe manifold having a free passage therethrough comprising: injection molding a plastic material around a brittle one-piece molding core containing at least one predetermined breaking point; after the removal of the manifold from the mold bending the hollow molded body in such a way that the molding core breaks into parts at the predetermined breaking point; and finally withdrawing the parts of the molding core completely from the manifold providing a free passage therethrough.

6. A molding core for making a flexible pipe manifold characterized by the fact that the molding core is in one piece, comprises a brittle material, and has at least one predetermined breaking point which is so disposed that after breaking, the molding core may be withdrawn completely at this point from the manifold providing a free passage therethrough.

4,094,689

GLASS COMPOSITIONS

Henricus Matheus Jacobus Marie van Ass, and Robert Georg Gossink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,014

Claims priority, application Netherlands, Apr. 12, 1976, 7603832

Int. Cl.[2] C03C *13/00*

U.S. Cl. 106—50 3 Claims

1. A glass composition suitable for processing into optical fibers with a radial gradient in the refractive index, consisting essentially of GeO_2, at least one oxide chosen from B_2O_3 and SiO_2, an alkali oxide selected from the group consisting of Li_2O, Na_2O, K_2O, wherein

$$GeO_2 \geqq 25 \text{ mole \%}$$
$$SiO_2 + B_2O_3 \geqq 25 \text{ mole \%}$$

and a totality of alkali oxide ≧ 15 mole %. according

2. Optical fibers with a radial gradient in the refractive index wherein a core having the highest refractive index wherein a core having the highest refractive index and a cladding having the lowest refractive index have a continuous transition zone, obtained froma pair of glass compositions according to claim 1 in which the alkali metal oxide of the core is Li_2O and/or Na_2O and the alkali metal oxide of the cladding is Na_2O and/or K_2O, the alkali metal in the cladding being other than the alkali metal in the core.

4,094,690

LIQUID COMPOSITION

Michael John Morton, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 382,198, Jul. 24, 1973, Pat. No. 3,994,740. This application Aug. 30, 1976, Ser. No. 718,463

Claims priority, application United Kingdom, Aug. 7, 1972, 36693/72

Int. Cl.[2] C04B *35/10*

U.S. Cl. 106—73.4 32 Claims

1. A process for the preparation of a fiber comprising a metal oxide and silica comprising the steps of

(a) providing a liquid composition having a viscosity of greater than 0.1 poise comprising an aqueous solution of a water-soluble metal compound and a water-soluble organic silicon compound which is stable to hydrolysis in the liquid composition and in which silicon atoms are attached to carbon atoms directly or through an oxygen atom and wherein the concentration of the metal compound expressed as equivalent metal oxide exceeds the concentration of the silicon compound expressed as silicon dioxide;

(b) fiberizing the said liquid composition to form fibers; and

(c) heating the said fibers to decompose the metal compound and the silicon compound to oxides.

4,094,691

MORTAR FOR ANTICONDENSATE, ANTIMOISTURE, HEAT-INSULATING, AND BIOCIDAL PLASTER

Dinu Stefan Moraru; Ion Pitis, both of Bucharest, and Constantin Bogos, Iasi, all of Romania, assignors to Institutul de Cercetari in Constructii si Economia Constructiilor, Bucharest, Romania

Filed Mar. 10, 1977, Ser. No. 776,268

Int. Cl.[2] C04B *7/355*

U.S. Cl. 106—95 4 Claims

1. A mortar for interior plastering having anticondensate, antimoisture diffusive, heat insulating and biocidal properties, consisting essentially of a mixture in volume parts of:

about 20 parts of 1 mm pearlite grains;

an effective amount up to 0.1 parts of a copper naphthenate solution in white spirit in proportions by volume of 1:1;

0.1 to -0.2 parts of calcium stearate powder;

an effective amount up to 1 part of white spirit;

about 5 parts of lime paste;

2 to 2.5 parts of Portland cement; and

about 5 parts of water.

4,094,692

PROCESS FOR STABILIZING CEMENT STONE FORMED WITH ALUMINOUS BINDERS

Eberhard Rauschenfels, Wiesbaden-Sonnenberg, Germany, assignor to Dyckerhoff Zementwerke Aktiengesellschaft, Wiesbaden-Amoneburg, Germany

Filed Jan. 6, 1977, Ser. No. 757,423

Claims priority, application Germany, Jan. 10, 1976, 2600769

Int. Cl.[2] C04B *7/32*

U.S. Cl. 106—104 8 Claims

8. An aluminous binder suitable for forming cement stone containing calcium sulfite waste obtained from purification of furnace flue gases in an amount of at least 0.2 weight % up to about 10 weight % calculated as $CaSO_3$.

4,094,693

D,L TARTARIC ACID AS RETARDANT FOR GYPSUM PLASTER

Helmut Knorre, Seligenstadt; Manfred Langer, Hanau, and Peter Leidl, Cologne, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Sep. 14, 1976, Ser. No. 723,173
Claims priority, application Germany, Sep. 24, 1975, 2542535
Int. Cl.² C04B *11/14*
U.S. Cl. 106—111 8 Claims

1. Gypsum plaster having sufficient D,L-tartaric acid therein to delay the setting time of the plaster and having sufficient calcium hydroxide that a 5% by weight aqueous paste of the plaster has a pH of at least 11.5, the content of D,L-tartaric acid being between 0.01 and 0.5 weight %.

4,094,694

WATER-RESISTANT GYPSUM COMPOSITION AND PRODUCTS, AND PROCESS OF MAKING SAME

William J. Long, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation of Ser. No. 669,945, Mar. 24, 1976, abandoned. This application May 16, 1977, Ser. No. 796,926
Int. Cl.² C04B *11/14*
U.S. Cl. 106—111 44 Claims

1. A water-resistant cementitious composition consisting essentially of a set mass of hydrated gypsum crystals, and a waterproofing composition, said waterproofing composition comprising asphalt and wax originally added as an emulsion, a borate-containing compound and polyvinyl alcohol, the dry weight percent of the total of said asphalt and said wax based on the dry weight of said cementitious composition being at least about 1.6%, said polyvinyl alcohol being present in an amount of at least 0.015 weight percent based on the dry weight of said cementitious composition, and said borate-containing compound being present in an amount effective to cooperate with said polyvinyl alcohol and said asphalt and wax to enhance the water-resistance of said cementitious composition.

4,094,695

PLASTICIZED CELLULOSE ESTER COMPOSITIONS

Robert R. Sanders, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 5, 1976, Ser. No. 711,923
Int. Cl.² C08L *1/10*
U.S. Cl. 106—179 11 Claims

1. A composition comprising an ester of cellulose and one or more carboxylic acids of two to four carbon atoms and a plasticizing amount of (1) poly(tetramethylene glycol) having a molecular weight of about 800 to 1200, (2) a poly(alkylene glycol) copolymer in which 10 weight percent or less is made up of units derived from ethylene oxide and the remainder is made up of units derived from propylene oxide, the copolymer having a molecular weight of about 800 to 1200, (3) poly(propylene glycol) having a molecular weight of about 800 to 1200, or (4) a carboxylic acid ester of (1), (2), or (3) in which the carboxylic acid moiety contains about 2 to 8 carbon atoms.

8. A thermoplastic coating composition in the form of a powder having an average particle size of between about 10 and 300 microns in which the film-forming ingredient consists essentially of a cellulose acetate butyrate wherein the plasticizer is (1) poly(tetramethylene glycol) having a molecular weight of about 800 to 1200, (2) a poly(alkylene glycol) copolymer in which 10 weight percent or less is made up of units derived from ethylene oxide and the remainder is made up of units derived from propylene oxide, the copolymer having a molecular weight of about 800 to 1200, (3) poly(propylene glycol) having a molecular weight of about 800 to 1200, or (4) a carboxylic acid ester of (1), (2) or (3) in which the carboxylic acid moiety contains about 2 to 8 carbon atoms.

4,094,696

ASPHALT EMULSION PAVING COMPOSITION

Michael V. Burris, 723 S. Third St., Las Vegas, Nev. 89101

Filed May 17, 1976, Ser. No. 686,733
Int. Cl.² C08L *95/00*
U.S. Cl. 106—277 9 Claims

1. An asphalt emulsion composition consisting essentially of: an oil phase having between about 5 and about 15 parts by weight gilsonite, between about 5 and about 15 parts by weight naphtha and between about 70 and about 90 parts by weight asphalt and having a residue from distillation penetration less than 40 dmm at 77° F, between about 0.1 and about 2% of a cationic emulsifying agent, and water, the ratio of oil;water being between about 1;1 and 2;1 by weight, respectively.

4,094,697

ASPHALT CEMENT AND CONCRETE COMPOSITIONS AND FILLER COMPOSITIONS THEREFOR

Fritz S. Rostler, Bakersfield, Calif., assignor to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 696,926, Jun. 17, 1976, which is a continuation of Ser. No. 495,603, Aug. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 406,865, Oct. 16, 1973, abandoned. This application May 16, 1977, Ser. No. 796,983
Int. Cl.² C08L *95/00*; C09D *3/24*
U.S. Cl. 106—280 26 Claims

1. A filler composition for asphalt which comprises a pelleted mixture of carbon black having a BET-N_2 surface area of at least about 40 m^2/g and a dibutyl phthalate absorption value of at least about 60 c.c./100 g and an essentially nonvolatile asphalt-solvating oil, the weight ratio of said carbon black to said oil being between 90 to 10 and 60 to 40; said pelleted mixture having a 325-mesh residue value, as determined by the Residue Value Test procedure described herein, of not more than about 4 weight percent thereof, and which pelleted mixture, when dispersed into 100 parts by weight of +30—20 sieve analysis Ottawa sand and 2 parts by weight of asphalt cement by hand stirring of the combined ingredients for from three to six minutes at a temperature of about 325° F, results in an improved asphalt composition having reduced pellet abrasion properties as determined by the Pellet Abrasion Test procedure described herein.

4,094,698

DYE OR COLOR DEVELOPING INORGANIC PIGMENTS

Thomas D. Thompson, Flemington, N.J., assignor to Yara Engineering Corporation, Elizabeth, N.J.

Filed Sep. 16, 1974, Ser. No. 506,103
Int. Cl.² C04B *31/00*
U.S. Cl. 106—288 B 10 Claims

1. An oxidizing clay for pressure sensitive record materials comprising an acid leached clay from the group consisting of bentonite and montmorillonite carrying ion exchanged cupric ions.

4,094,699

PROCESS FOR CONVERTING PREMILLED QUINACRIDONE TO PIGMENTARY FORM

Patrick Henry Fitzgerald, Edison, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 1, 1976, Ser. No. 746,299
Int. Cl.² C09B *48/00*
U.S. Cl. 106—288 Q 3 Claims

1. A process for converting premilled quinacridone to pigmentary form by contacting the premilled quinacridone with an aqueous alkaline medium consisting essentially of water having a pH of at least 10 in an amount sufficient to intimately contact the premilled quinacridone at a temperature of at least 85° C. in the presence of at least one surfactant selected form

cationic and nonionic surfactants, wherein the cationic surfactant is in an amount from 2 to 9% by weight, based on the weight of the premilled quinacridone and the nonionic surfactant is in an amount from 2 to 8% by weight, based on the weight of the premilled quinacridone.

4,094,700

APPARATUS AND PROCESS FOR THE PRODUCTION OF GLUTEN AND STARCH FROM WHEAT, RYE, OR BARLEY

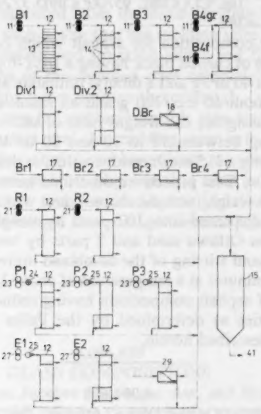
Harri Rennes, Raisio, Finland, and Christian Lippuner, Niederuzwil, Switzerland, assignors to Gebrueder Buehler AG, Uzwil, Switzerland and Oy Vehna AB, Raisio, Finland, part interest to each

Filed Sep. 20, 1976, Ser. No. 724,839

Claims priority, application Switzerland, Sep. 23, 1975, 12347/75

Int. Cl.² C13L *1/02*

U.S. Cl. 127—24 22 Claims



1. In the method of producing starch and gluten from a grain such as wheat, rye or barley, comprising the steps of dispersing endosperm fractions derived through the grain milling process in water, separating the dispersion into a starch-rich fraction and a gluten-rich fraction by centifugation, maintaining the gluten-rich fraction at an elevated temperature level for a predetermined period of time to allow the gluten to form filiform agglomerates, adding water to the agglomerate-containing fluid to expand the size of the agglomerate, and separating the gluten accumulation from the resultant mixture, the improvement comprising the additional step of initially grinding the grain to obtain the endosperm fractions by the method comprising the steps of:

(a) breaking and sifting the grain to obtain finished endosperm fractions, a fine product, a coarse product, and a bran waste product;

(b) sizing the coarse product by cutting and sifting to produce finished endosperm fractions and a sized product;

(c) pressing, impacting, and softing the sized product and the fine product to produce finished endosperm fractions and tailings; and

(d) finally reducing the tailings to produce finished endosperm fractions and a fine bran waste product.

4,094,701

METHOD FOR CLEANING TIN SURFACES

Douglas D. Fekete, Warren, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Mar. 18, 1976, Ser. No. 668,011

Int. Cl.² B08B *3/08*

U.S. Cl. 134—2 5 Claims

1. A process for cleaning a tin surface without substantial etching thereof comprising contacting the surface with an aqueous alkaline solution having a pH value of at least 9.0 and containing an organic tannin in an amount sufficient to inhibit etching of the surface.

4,094,702

METHOD AND APPARATUS FOR CONTROLLING BY-PASS LIQUID FLOW IN DISH-WASHING MACHINES

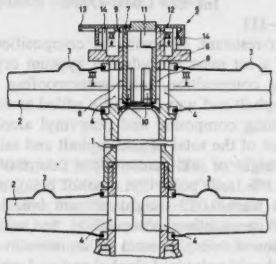
Sergio Rabuffetti, Castronno, Italy, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 596,970, Jul. 17, 1975, abandoned. This application Jan. 13, 1977, Ser. No. 759,058

Claims priority, application Italy, Jul. 11, 1974, 25019 A/74

Int. Cl.² B08B *3/02, 11/02*

U.S. Cl. 134—10 3 Claims



1. A method of washing dishes in a dish-washing machine having a plurality of baskets for containing dishes, at least one washing liquid spray device associated with each basket and having spray nozzles, and providing at least one selectable operative cycle, and a single means for circulating washing liquid to said spray devices, comprising setting a reduced flow rate to each spray device independently of the flow rate of other spray devices and the operative cycles selected, by the step of by-passing a portion of circulated liquid from flowing through any of the spray nozzles and returning said portion for recirculation by the single means.

4,094,703

SOLAR ENERGY CONVERTER

Gregory J. Williams, Ithaca, N.Y., assignor to Cornell Research Foundation, Ithaca, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,775

Int. Cl.² H01L *31/04*

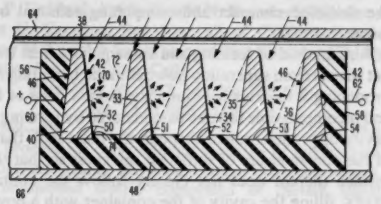
U.S. Cl. 136—89 TF 11 Claims

1. An improved converter for converting light energy to electrical energy comprising:

a plurality of electrically conductive electrode elements each having a first, photoemissive surface and a second, anode surface;

means mounting said electrode elements in spaced, insulated relationship, said first surface of each electrode element facing said second surface of the next adjacent electrode element, each pair of facing surfaces and the intervening space therebetween defining a voltage cell and said plurality of elements defining a plurality of voltage cells in series, said mounting means securing said electrodes in geometrically arrayed, generally parallel relationship so

that incident light will produce photoemission from only the first surface of each voltage cell, the second surface of



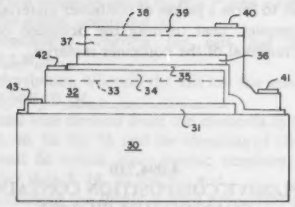
each voltage cell being so positioned as to intercept the electrons from its corresponding first surface.

4,094,704

DUAL ELECTRICALLY INSULATED SOLAR CELLS

Arthur G. Milnes, 1417 Inverness Ave., Pittsburgh, Pa. 15217

Filed May 11, 1977, Ser. No. 795,811
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 TF 13 Claims



1. A solar cell, adapted for superposition upon an underlying solar cell, comprising a substrate transparent to a first range of sunlight, an intermediate solid rheotaxy layer of a semi-conductor compound transparent to a second range of sunlight overlying said substrate, the first range being at least as great as the second range, the intermediate layer being selected from the group consisting of: Se, As_2Se_3, As_2S_3, Sb_2S_3, Sb_2Se_3, GeS, GeSTe, GeSe, $SnSe_2$ and In_2S and intercompounds of those constituents, and a solar cell layer overlying said rheotaxy layer and comprising a polycrystalline semiconductor compound having a larger crystal grain size than the substrate.

8. The solar cell of claim 1 in combination with an underlying solar cell electrically insulated therefrom, the bandgap of the overlying solar cell being greater than the bandgap of the underlying solar cell.

4,094,705

ALUMINUM ALLOYS POSSESSING IMPROVED RESISTANCE WELDABILITY

Philip R. Sperry, Chesterfield, Mo., and Frank N. Mandigo, Northford, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 28, 1977, Ser. No. 781,718
Int. Cl.[2] C22F *1/04;* C22C *21/06*
U.S. Cl. 148—2 23 Claims

1. An aluminum base alloy having improved resistance weldability plus excellent strength and formability, consisting essentially of 1.0 to 5.0% magnesium, 0.3–1.0% lithium, up to 1% manganese, up to 0.3% titanium, up to 0.20% vanadium, and balance aluminum, wherein said lithium is substantially retained in solid solution, said alloy being capable of withstanding elevated temperature without undue loss of strength and formability properties.

17. A method for the preparation of wrought products exhibiting improved resistance weldability plus excellent strength and formability, wherein said alloy is capable of withstanding elevated temperature without undue loss of strength and formability properties which comprises:

A. providing an aluminum base alloy consisting essentially of 1.0 to 5.0% magnesium, 0.3 to 1.0% lithium, up to 1% manganese, up to 0.3% titanium, up to 0.20% vanadium, and balance aluminum;
B. casting said alloy;
C. heating said alloy to a homogenizing temperature and thereafter homogenizing said alloy;
D. hot and cold working said alloy; and
E. annealing said alloy whereby said wrought products are capable of plastic deformation to form automotive body parts.

4,094,706

PREPARATION OF ZIRCONIUM ALLOYS

Erland Maxwell Schulson, Deep River, and Donald James Cameron, Pinawa, both of Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 465,654, Apr. 30, 1974, abandoned. This application Aug. 4, 1976, Ser. No. 711,744
Claims priority, application Canada, May 11, 1973, 171070
Int. Cl.[2] C21D *1/02;* C22D *16/00*
U.S. Cl. 148—11.5 F 19 Claims

1. A method of producing a high tensile strength, creep and corrosion resistant zirconium alloy, consisting essentially of 7.0–10.0 wt.% Al, 0-3 wt.% in total of one or more elements selected from the group consisting of magnesium, tin, chromium, iron, carbon, silicon, yttrium, niobium, molybdenum and beryllium, balance zirconium and incidental impurities, comprising annealing said alloy, in a state substantially devoid of untransformable Zr_2Al particles, at a temperature below about 992° C for a period of time sufficient to produce a substantially continuous matrix of the intermetallic compound Zr_3Al in said alloy

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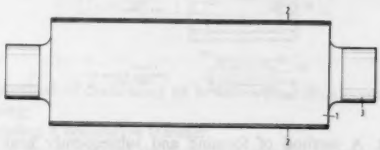
4,094,707

MAKING WITHDRAWAL ROLLERS FOR INGOTS

Hans Schrewe, Duisburg, and Klaus Frenken, Krefeld, both of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Germany

Filed Aug. 8, 1977, Ser. No. 822,918
Claims priority, application Germany, Aug. 9, 1976, 2636199
Int. Cl.[2] B21H *1/14*
U.S. Cl. 148—12 R 7 Claims



1. A method of making rollers for withdrawal of hot ingots, comprising the steps of:

making a roller body of high tensile material but requiring thermal treatment for enhancing toughness;
providing a relatively thick protective coating onto the roller, and sintering the coating;
mechanically surface finishing the coating; and thermally treating the roller body carrying the coating to enhance toughness and tensile strength of the roller.

4,094,708

TITANIUM-BASE ALLOYS

Roger Thomas John Hubbard, Sutton Coldfield; Richard Ernest Goosey, Solihull, and Donald Francis Neal, Lichfield, all of England, assignors to Imperial Metal Industries (KYNOCH) Limited, Birmingham, England

Continuation of Ser. No. 305,329, Nov. 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 797,674, Feb. 7, 1969, abandoned.

Filed Feb. 17, 1977, Ser. No. 769,786

Claims priority, application United Kingdom, Feb. 16, 1968, 7776/68

Int. Cl.[2] C22C *14/00*

U.S. Cl. 148—32.5 2 Claims

1. A high strength creep resistant titanium-base alloy consisting of 6% aluminium, 5% zirconium, 0.5% molybdenum, 0.25% silicon, balance titanium, apart from impurities, said alloy having a creep strain less than 0.1% in 100 hours at 520° C at a stress of 20 tonf/in^2 and in the as welded condition a room temperature ductility of at least 15% reduction in area and 10% elongation when measured on a gauge length of $4\sqrt{S_o}$ where S_o is the cross-sectional area, the alloy being beta solution treated at 1050° C, cooled and aged for not less than 24 hours at a temperature not less than 500° C, and air cooled, whereby the alloy has an alpha plate-like structure with precipitate at the alpha plate boundaries, said precipitate being a titanium/molybdenum silicide, and having a principally body centred cubic structure.

4,094,709

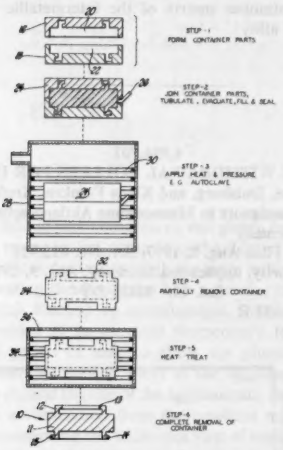
METHOD OF FORMING AND SUBSEQUENTLY HEAT TREATING ARTICLES OF NEAR NET SHAPED FROM POWDER METAL

Walter J. Rozmus, Birmingham, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Feb. 10, 1977, Ser. No. 767,522

Int. Cl.[2] B22F *1/00*

U.S. Cl. 148—126 6 Claims



1. A method of forming and subsequently heat treating articles of near net shape from powder metal including the steps of producing a thickwalled container by forming a cavity of predetermined shape in a mass of suitable container material such that the walls of the container are of sufficient thickness so that the exterior surface thereof does not closely follow the contour of the cavity, filling the cavity of the container with powder metal, and applying heat and pressure to the container such that the container material acts like a fluid to apply hydrostatic pressure to the heated powder metal contained in the cavity thereby consolidating the powder metal to produce a densified compact; the improvement comprising the steps of preparing the densified compact for heat treating by selectively removing portions of the container to form a jacket of container material around the densified compact, heat treating the densified compact and completing removal of the container material.

5. A method of forming and subsequently heat treating near net shapes from superalloy powder metal including the steps of producing a thickwalled container from a mass of fully dense and incompressible ferrous-base material by forming a complex cavity of predetermined shape in the mass such that the walls of the container are of sufficient thickness so that the exterior surface thereof does not closely follow the contour of the cavity, filling the cavity of the container with a powder metal selected from a group consisting of nickel, cobalt, and ferrous-based superalloy powder and consolidating the powder metal by heating the container and powder metal to a temperature at which the powder metal will consolidate and by applying pressure to the heated container sufficient to cause plastic flow of the ferrous-base container material whereby the container material acts like a fluid to apply hydrostatic pressure to the heated powder metal contained in the cavity thereby consolidating the powder metal to produce a densified compact; the improvement comprising the steps of preparing the densified compact for heat treating by selectively removing portions of the container to form a jacket of container material around the densified compact, heat treating the densified compact and completing removal of the container material.

4,094,710

EXPLOSIVE COMPOSITION CONTAINING GUANIDINIUM PICRATE

Carl Boyars, and Mortimer J. Kamlet, both of Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1973, Ser. No. 390,443

Int. Cl.[2] C06B *45/18*

U.S. Cl. 149—3 8 Claims

1. An explosive composition comprising a layer of guanidinium picrate completely surrounding an explosive material which is selected from the group consisting of (a) explosive materials having greater impact sensitivity than guanidinium picrate has, (b) explosive materials having lower thermal stability than guanidinium picrate has, and (c) mixtures thereof.

4,094,711

TRACER AND COMPOSITION

Jawaharlal Ramnarace, Dana Point, Calif., assignor to Ford Aerospace & Communications Corporation, Dearborn, Mich.

Filed Sep. 1, 1977, Ser. No. 829,995

Int. Cl.[2] C06B *45/36*

U.S. Cl. 149—4 7 Claims

1. An improved tracer round comprising a projectile with a cavity containing tracer compositions wherein the tracer composition comprises a consolidated rubbery particulate tracer mixture which comprises:

(A) about 30–60 parts by weight magnesium;

(B) about 10–40 parts by weight polytetrafluoroethylene; and

(C) about 10–25 parts by weight copolymer of hexafluoropropylene and vinylidenefluoride,

wherein a coating on (A) and (B) comprises the copolymer of (C).

4,094,712

CONSOLIDATED CHARGES INCORPORATING INTEGRAL IGNITION COMPOUNDS

Terrence P. Goddard, Aptos; Donald N. Thatcher, Hollister, and Charles G. Garrison, San Jose, all of Calif., assignors to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc., Hollister, Calif.

Filed May 10, 1977, Ser. No. 795,473
Int. Cl.[2] C06B 45/28
U.S. Cl. 149—10 19 Claims

1. In a process for consolidating a charge of nitrocellulose-based propellant grains, the improvement of incorporating an ignition compound matrix comprised of certain decahydrodecaborate compounds, through the steps of:

(A) wetting loose propellant grains on their exterior surfaces with a consolidating fluid having a solvating effect on said grains, the consolidating fluid being in the range of approximately 0.010 to 0.100 milliliters of fluid per gram of propellant, and,

(B) introducing a layer of decahydrodecaborate compound onto the exterior surfaces of said grains as the result of the wetting effect of said consolidating fluid, wherein said compound is in the range of approximately 0.1% to 4.0% of the total propellant weight, wherein said compound further includes a salt selected from the class of salts having the common anion $B_{10}H_{10}^{-2}$, and a cation selected from the group consisting of:

(i) ammonium, wherein the salt has the formula $(NH_4)_2B_{10}H_{10}$;

(ii) hydrazinium, wherein the salt has the general formula $(NH_2NH_3)B_{10}H_{10}$;

(iii) metal ions derived from the elements in Groups 1, 2, 8, 3*b*, 4*b*, 5*b*, 6*b*, 7*b*, and the elements of Groups 3*a*, 4*a*, 5*a*, and 6*a* which have atomic numbers respectively greater than 5, 14, 33 and 52; and

(C) consolidating the thusly wetted propellant grains into a consolidated charge by a compaction step, wherein the decahydrodecaborate compound layer on each grain becomes a matrix between the grain-to-grain boundaries of the consolidated charge.

4,094,713

SENSITIZING LIQUID EXPLOSIVES WITH HIGH GAMMA GAS

B. Arthur Breslow, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 21, 1977, Ser. No. 761,189
Int. Cl.[2] C06B 47/08
U.S. Cl. 149—36 16 Claims

1. A method for sensitizing a liquid explosive that has a desensitizing agent added, said method comprising the steps of:

A. providing a high gamma gas, bubbles of which are capable of overcoming the effect of said desensitizing agent and

B. bubbling said high gamma gas into said explosive.

4,094,714

STABILIZED NITRATO-ALKANOL EXPLOSIVE COMPOSITION

George Henry Barnett, Kew, Australia, assignor to ICI Australia Limited, Melbourne, Australia

Division of Ser. No. 634,179, Nov. 21, 1975. This application Jul. 19, 1977, Ser. No. 816,931
Claims priority, application Australia, Dec. 9, 1974, PB9949
Int. Cl.[2] C06B 25/00
U.S. Cl. 149—88 16 Claims

1. An explosive composition of the aqueous slurry type, comprising:

an aqueous slurry of one or more inorganic oxygen releasing salts,

water, and

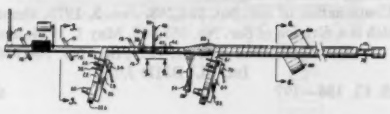
a sensitizer component comprising at least one nitrato-alkanol and a stabilizingly effective amount of one or more derivatives of carbamic acid, the said sensitizer component being present in sensitizing amount and being soluble and dissolved in the aqueous phase of the said explosive composition.

4,094,715

METHOD AND APPARATUS FOR APPLYING FOAM INSULATION TO PIPE

Stewart Henderson, and Ralph Hielema, both of Calgary, Canada, assignors to Henderwood Industries, Ltd., Calgary, Canada

Filed Aug. 27, 1976, Ser. No. 718,394
Int. Cl.[2] B32B 5/18
U.S. Cl. 156—78 19 Claims



1. A method of applying a foamable liquid to a cylindrical object, comprising:

moving the object along its longitudinal axis;

simultaneously rotating the object about its longitudinal axis;

first spraying the foamable liquid onto the object;

allowing the foamable liquid to rise substantially on the object; and

wrapping the foamable liquid with a flexible sheet material while the risen foam is still deformable,

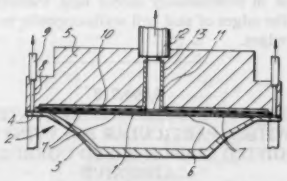
said wrapping step including applying sufficient pressure to the risen foam through the sheet material to increase the density of the foam only in the vicinity of the foamed surface.

4,094,716

METHOD OF AND APPARATUS FOR DECORATING ARTICLES WITH DECALCOMANIAS

Eduardo Valdez Lopez, Colloto (Oviedo), Spain, assignor to Iberica de Calcomanias, S.A., Spain

Continuation of Ser. No. 512,913, Oct. 7, 1974, abandoned. This application Nov. 8, 1976, Ser. No. 740,071
Int. Cl.[2] B44C 1/16
U.S. Cl. 156—87 1 Claim



1. A method of decorating an article with a decalcomania, comprising;

perforating a decorative transfer;

wetting the perforated decalcomania transfer to remove it from a substrate thereof;

backing the wetted transfer by a flexible backing sheet stronger than the transfer to hold the transfer, backed by the backing sheet, over a surface portion of an article such as a ceramic plate, which surface portion is to be decorated with the transfer, while holding a marginal portion of the backing sheet to a marginal portion of the article surrounding the surface portion, to define an enclosed space by and between the article and the backing sheet, the backing sheet having an aperture in the enclosed space,

and to hold the wetted perforated transfer in the enclosed space between the backing sheet and the article;

exhausting air from the enclosed space through the perforated transfer and the aperture of the backing sheet for drawing the transfer, backed by the flexible backing sheet, firmly onto the surface portion of the article, to bond the transfer to the article;

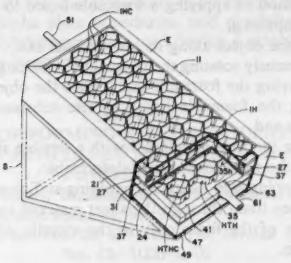
subjecting the article with the wetted perforated bonded transfer to heat, and permitting any resulting steam to escape through the perforated transfer to prevent cracking of the transfer.

4,094,717

METHOD OF ASSEMBLY OF AN INSULATING PANEL ARRANGEMENT

Irwin R. Barr, Baltimore County, Md., assignor to AAI Corporation, Cockeysville, Md.

Continuation of Ser. No. 583,248, Jun. 3, 1975, abandoned, which is a division of Ser. No. 465,845, May 1, 1974, abandoned.
This application Jan. 31, 1977, Ser. No. 764,146
Int. Cl.² B31D *3/02*
U.S. Cl. 156—197 **6 Claims**



1. The method of assembly of an insulating honeycomb sandwich array; comprising

forming an insulating bead along the edges of the cell walls of a honeycomb section,

and securing a sheet to said honeycomb section by bonding said sheet to said insulating bead, and in spaced relation from said cell wall edges and with said bead forming a separating insulating layer between said honeycomb section and said sheet,

securing a second heat conductive sheet to said honeycomb section in substantially direct heat transfer engagement with the edges of said cell walls opposite to said insulated bead edges.

4,094,718

PROCESS OF PREPARING CORRUGATED PAPER BOARD WITH A PARTICULAR POLYVINYL ALCOHOL MODIFIED STARCH-BASED CORRUGATING ADHESIVE

Edward Peter Czerwin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 17, 1975, Ser. No. 632,725
Int. Cl.² B31F *1/20*; C08L *3/02*
U.S. Cl. 156—210 **6 Claims**

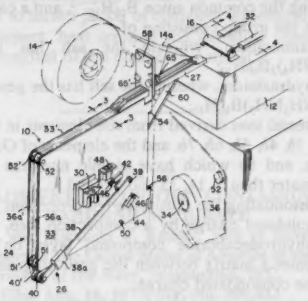
1. An improved continuous process of preparing corrugated board consisting of at least one liner and at least one fluted medium, which process includes the steps of (1) continuously applying to the tips of the corrugations of the fluted medium a composition comprising at least 15%, based upon the weight of the total solids on a dry basis, of a potentially adhesive ungelatinized starch and up to 85%, based upon the weight of the total solids on a dry basis, of a viscous gelatinized starch carrier therefor, (2) bringing a liner in contact with the adhesive coated tips of the corrugated medium; and (3) applying heat and pressure to bond said liner and fluted medium, the improvement consisting of employing in said composition from about 2 to about 20 percent, by weight of the total starch present, of polyvinyl alcohol having a degree of hydrolysis of from about 99 to about 100 percent, a 4 percent aqueous solution viscosity at 20° C. of from about 5 to about 60 centipoises, less than about 3 percent by weight cold water solubles at 30° C., at least about 80 percent by weight hot water solubles at 70° C., at least about 95 percent of said polyvinyl alcohol having a particle size less than about 45 microns and substantially all of said polyvinyl alcohol having a particle size less than about 75 microns.

4,094,719

METHOD FOR DISPENSING ADHESIVE TRANSFER TAPE FOR ENGAGEMENT WITH A MOVING STRIP OF PHOTOGRAPHIC FILM PRINTS

Herman L. Jones, 7302 84th St. N.E., Marysville, Wash. 98270, and John H. Haugen, 9925 Davies Rd., Lake Stevens, Wash. 98258

Division of Ser. No. 505,253, Sep. 12, 1974, Pat. No. 4,001,073.
This application Oct. 21, 1976, Ser. No. 734,467
Int. Cl.² B32B *31/00*; B65C *9/25*
U.S. Cl. 156—250 **22 Claims**



1. A method for dispensing adhesive transfer tape, comprising the steps of: dispensing a strip of pressure sensitive adhesive transfer tape composed of a transferable pressure sensitive adhesive layer and a releasable backing strip; directing the dispensed tape strip into a course of travel aligned with the direction of travel of a moving strip of photographic film prints; and guiding the tape strip by confining and guiding it along an elongated path in the course of travel during said directly step, such that its adhesive layer and the back face of the print strip may be engaged progressively in superimposed face-to-face relation.

4,094,720

STRIP CORE SHEET LENGTH CONTROL

David F. Talbert, Millboro Springs, Va., assignor to Westvaco Corporation, New York, N.Y.

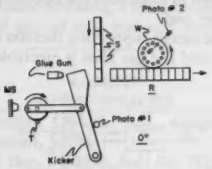
Filed Feb. 8, 1977, Ser. No. 766,698
Int. Cl.² G05G *7/00*
U.S. Cl. 156—304 **10 Claims**

1. A method of controlling the discharge of adhesive from a remotely actuated, pressurized gun onto one face of elongated material strips delivered in continuous, edge-to-edge, individual succession to a collimating breech for face-to-face laminated assembly production by cyclically reciprocating kicker means comprising the steps of:

A. Generating a first signal when said kicker means passes a first position in a 360° kicker cycle to operate said gun for adhesive discharge onto one of said strips;

B. Generating a second signal when said kicker means passes a second position in said cycle later than said first position to disable said gun from operation by said first signal; and,

C. Generating a third signal when said kicker means passes a third position in said cycle later than said second position and in response to a positive, face-to-face addition of



a strip to a preceding assembly, said third signal being effective to inactivate the disabling result of said second signal and enable said gun to be operated by said first signal.

4,094,721

PARTIALLY CRYSTALLINE COPOLYESTERS USEFUL AS ADHESIVES

Karl Günter Sturm, St. Augustin, and Klaus Brüning, Bergisch-Gladbach, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jul. 15, 1975, Ser. No. 596,048
Claims priority, application Germany, Jul. 25, 1974, 2435863
Int. Cl.[2] C09J 5/00
U.S. Cl. 156—309 **24 Claims**

1. A linear saturated crystalline polyester of an acid moiety and a moiety of a dihydric alcohol, at least 40 mol percent of the acid moiety being a terephthalic acid moiety, said polyester containing as moieties of the dihydric alcohol moieties of 1,4-butanediol and 1,6-hexanediol, the ratio of the 1,4-butanediol moieties to 1,6-hexanediol moieties being 10:90:–90:10, said polyester being further characterized by:

A. a glass transition temperature of $-10°$ C to $+30°$ C;

B. a melting point of 40°–130° C;

C. a difference between the glass transition temperature and the melting being equal to or less than 100° C;

D. a maximum logarithmic damping decrement from 0.6 to >1.3; and

E. a reduced viscosity, measured on a 1 wt.-% solution in a 60–40 mixture of phenol and 1,1,2,2-tetrachloroethane, of 0.5 to 1.5.

17. In a process for securing one substrate to another by disposing between said substrates a heat-fusible material and maintaining the substrates in sufficient juxtaposition until said material has fused and bond one of said substrates to the other, the improvement which comprises employing a heat-fusible material of the polyester of claim 1.

4,094,722

ETCHING APPARATUS USING A PLASMA

Shinichi Yamamoto; Yasusuke Sumitomo, both of Yokohama; Yasuhiro Horiike, Tokyo, and Masahiro Shibagaki, Hiratsuka, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1977, Ser. No. 762,386
Claims priority, application Japan, Jan. 29, 1976, 51-7957
Int. Cl.[2] C23F 1/02
U.S. Cl. 156—345 **10 Claims**

1. An apparatus for etching an object comprising:

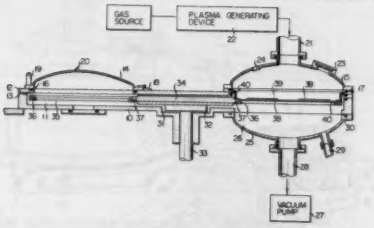
(a) a source of gas activatable for providing an etching action;

(b) plasma generator means for receiving and activating said gas;

(c) an apparatus body including an airtight hollow substantially flat chamber forming an object-feeding chamber and an object-etching chamber wherein an object for etching is presented to a flow of said activated etching gas, said object-etching chamber being spaced from said object-feeding chamber in a substantially horizontal plane and remote from said plasma generator means;

(d) a support plate positioned in said hollow substantially flat chamber for rotation in said substantially horizontal plane;

(e) at least one object holder provided on said support plate for positioning in said object-feeding chamber when said support plate is rotated through a first angle to receive an object to be fed and for positioning in said object-etching chamber when said support plate is rotated through a second angle to present an object for etching to the flow of said activated etching gas;



(f) gas flow-guiding means for removing said activated etching gas from said plasma generator means, transferring said activated etching gas to said object-etching chamber, introducing the flow of said activated etching gas into said object-etching chamber substantially vertically above the object held by said object holder and withdrawing the flow of said gas from said object-etching chamber substantially vertically below the held object; and

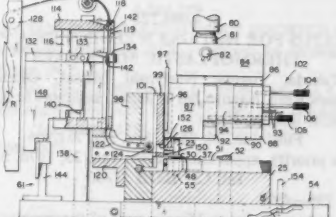
(g) gas flow-baffling means for ensuring said substantially-vertically downward flow of said activated etching gas past the held object in said object-etching chamber and for preventing said gas from flowing from said object-etching chamber to said object-feeding chamber.

4,094,723

VARIABLE WIDTH FILM SPLICER

Herman L. Jones, Marysville, Wash., assignor to J & H Manufacturing, Inc., Everett, Wash.

Filed Apr. 12, 1976, Ser. No. 676,061
Int. Cl.[2] G03D 15/04
U.S. Cl. 156—353 **11 Claims**



1. A splicer, comprising: guide means for guiding strips along a run in end-to-end relation, said guide means including spaced apart edge guide elements adjustable to accept strips of different widths along said run; splicing means mounted adjacent said run for effecting a splice between adjacent strip ends, said splicing means including applicator means adjustable to apply different lengths of splicing tape between adjacent strip ends; and control means for controlling said guide means and said splicing means by adjusting said edge guide elements to accept strips of different widths, and adjusting said applicator

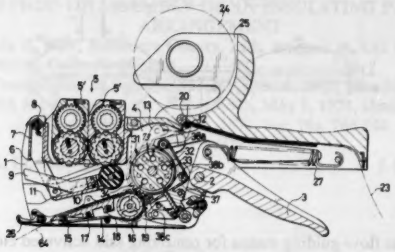
means to apply different lengths of splicing tape in relation to the strip widths acceptable by said edge guide elements.

4,094,724

LABEL CUTTING DEVICE FOR LABEL APPLYING MACHINE

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Tokyo, Japan

Filed Oct. 6, 1976, Ser. No. 730,121
Claims priority, application Japan, Oct. 18, 1975, 50-124892
Int. Cl.² B41M *1/00*
U.S. Cl. 156—384 **26 Claims**



1. A label cutting device for a label applying machine, comprising:

an operating lever movable between a first and a second position;

a roller connected to said lever for being rotated thereby as said lever is moved to one of its said positions; said roller having a periphery; a blade receiving means defined in said roller periphery; said roller being rotatable to bring said blade receiving means to a cutting position;

a cutting blade held nonrotatively stationary with respect to rotation of said roller and positioned at said cutting position; said cutting blade being movable toward and into engagement with said blade receiving means when said roller has rotated to position said blade receiving means at said cutting position; said cutting blade being connected to said lever so as to be reciprocatingly moved toward and away from engagement with said blade receiving means as said lever is moved;

means for moving a label strip which is to be cut against said roller at said cutting position.

4,094,725

APPARATUS FOR HOT GAS WELDING OF A PAIR OF THERMOPLASTIC MATERIALS

Shinji Takeda, Toyota; Noriyoshi Mitsui, Okazaki, and Nobuharu Kato, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Jan. 24, 1977, Ser. No. 761,906
Claims priority, application Japan, Jan. 23, 1976, 51/6981
Int. Cl.² B32B *31/00*
U.S. Cl. 156—497 **7 Claims**

1. An apparatus for welding a pair of thermoplastic workpieces by means of hot gas blasting, which comprises:

nozzle means including;

a housing having a central bore and side walls; and,

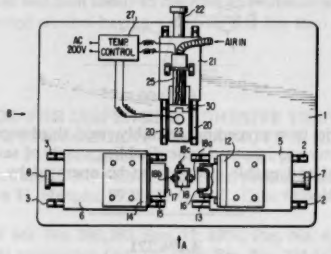
a pair of partition walls parallely arranged within said central bore in the longitudinal direction of said housing whereby a pair of chambers are formed between said partition walls and said housing side walls and wherein said partition walls include a plurality of bores which communicate said pair of chambers with said central bore and wherein said housing side walls include a plurality of nozzles from which said hot gas blast is ejectable.

2. The apparatus of claim 1, which further comprises:

a first movable means supporting thereon a workpiece to be welded;

a second movable means supporting thereon the other workpiece to be welded, said first and second movable means being arranged in alignment for opposing said workpieces to each other; and,

a third movable means supporting thereon said nozzle means from which said hot gas blast is ejectable, said third movable means being movable at right angles with respect to said first and second movable means,



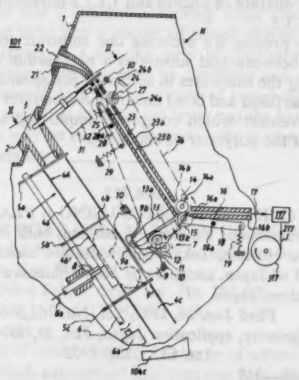
whereby said workpieces are heated by hot gas blast ejected from said third movable means upon said thid movable means being moved to a position between said first and second movable means and whereby said workpieces are pressurized to be welded into one piece upon relative movement of said first and second movable means.

4,094,726

APPARATUS FOR PROCESSING EXPOSED PHOTOGRAPHIC FILMS AND CASSETTES FOR SUCH FILMS

Friedrich Hujer, Grunwald, and Helmut Zangenfeind, Puchheim, both of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 5, 1976, Ser. No. 729,700
Claims priority, application Germany, Oct. 9, 1975, 2545214
Int. Cl.² G03D *15/04*
U.S. Cl. 156—502 **20 Claims**



1. In an apparatus for processing photographic films and containers for such films, a combination comprising a substantially lightproof housing having wall means provided with first and second inlets for admission of successive loaded containers and discrete films, respectively; film removing means in said housing; means for conveying containers from said first inlet into the range of said removing means; film splicing means in said housing; means for transporting films from said removing means said splicing means, including a first guide channel

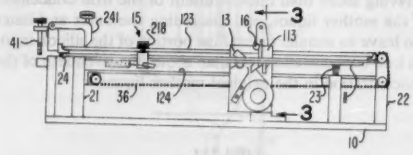
which receives successive films from said removing means and a second guide channel which receives successive films from said first channel and directs such films toward said splicing means; and means for transporting films from said second inlet to said splicing means, including a third channel wherein films advance from said second inlet into said second channel.

4,094,727

SHEET SPLICER

Joseph Martin Collins, Ontario, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 17, 1976, Ser. No. 751,657
Int. Cl.[2] B65H *21/00;* B31F *5/06*
U.S. Cl. 156—505 6 Claims



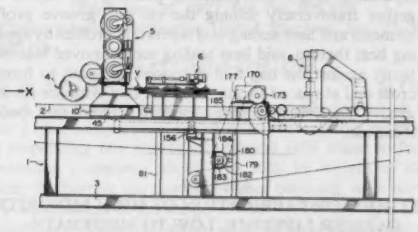
1. A sheet splicer comprising:
a frame,
a table mounted on said frame,
clamping means pivotably mounted about a clamp axis on said frame to secure overlapping plies of the sheets to be joined against movement on said table,
said table being pivotably mounted on a first side thereof said frame about an axis which is parallel to and spaced from the axis about which said clamping means is pivoted such that said sheets to be spliced may be laid on said table between a portion of the clamping means and said table,
said table being spring biased at the second free end side thereof remote from the pivoted axis for said table and adjacent the axis about which said clamping means pivots,
said clamping means having free end which is attached to be clamped to said frame adjacent the first side of the table adjacent the axis about which the table pivots,
such that there is an equidistant interference clamping fit along the width of the table along the splice line of sheets to be joined by a butt splice in said splicer,
a cutter mounted on guide rail means running parallel to said splice line and mounted above said clamping means
having a blade mounted therein attached to be drawn through overlapping plies of sheets to be spliced along the splice line to sever the sheet plies and to define a butt edge end of the upper and lower plies of said sheets which are to be spliced,
the opposite side of the defined cut of each ply being considered a selvage edge,
splicing tape applicator means being mounted on guide rails beneath said tape, which guide rails are parallel to said splice line and mounted on said frame, said table applicator means being adapted to carry a splicing tape for joining the butt ends of the sheet together,
having selvage edge removal means and spring means for pressing splicing tape drawn along said splice line to the butt edges of the sheets to be joined,
the cutter and the applicator means being interconnected by a flexible position synchronization interlock extending from the cutter means around the pivot clamp axis of said clamping means down under said table about a second point and across under the table and around a third point and back across under the table to interconnect to said applicator means such that the clamping means may be unclamped and lifted from the table while pivoting about said clamp axis without disconnection of the flexible interlock.

4,094,728

TIRE TUBE MAKING APPARATUS

Yohachiro Nakagawa, Kodaira, and Akio Tanihata, Akigawa, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 11, 1976, Ser. No. 741,030
Claims priority, application Japan, Nov. 14, 1975, 50-136871
Int. Cl.[2] B29H *15/00*
U.S. Cl. 156—514 2 Claims



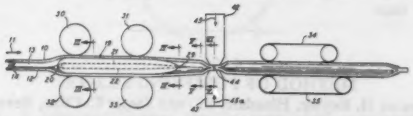
1. A tire tube making apparatus comprising:
a conveyor mechanism including a stationary frame and an endless belt travelled on said stationary frame by a drive source for conveying a tube material;
a perforating mechanism for perforating air introducing bores longitudinally equally spaced in an upper half portion of said tube material;
a valve feeding mechanism for intermittently feeding a tube valve one by one to a predetermined position above the line passing through said air introducing bores perforated in said tube material which is continuously conveyed by said conveyor mechanism;
a valve transferring mechanism for suckingly holding said tube valve fed by said valve feeding mechanism to transfer said tube valve one by one on said air introducing bore in synchronism with the transfer of said air introducing bore of said tube material; and
a valve urging mechanism for detecting said tube valve transferred by said valve transferring mechanism and including a movable frame movable on said stationary frame, a gripping device mounted on said movable frame to grip said endless belt for moving said movable frame jointly with said endless belt, and a valve urging device mounted on said movable frame for urging said tube valve against said tube material.

4,094,729

APPARATUS FOR MAKING OPEN PROFILE BAGS

Salvatore Boccia, Blauvelt, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Division of Ser. No. 577,883, May 15, 1975, Pat. No. 4,024,010.
This application Apr. 12, 1977, Ser. No. 786,858
Int. Cl.[2] A41H *37/06;* B31B *19/14*
U.S. Cl. 156—515 6 Claims



1. A mechanism for preparing bags of thin plastic film having continuous reclosable fastener profiles on the surface thereof comprising in combination:
means for continuously advancing facing layers of thin plastic bag film having facing interlocking rib and groove profiles on the inner surface extending along one edge of the layers with the profiles being interlocked;

a separating finger positioned between the rib and groove profiles along the path traveled by the layers having a leading separating edge so that the profiles are forcibly separated as they are advanced by the rib element being pulled out of the groove element;

aligning means positioned immediately after said separating edge holding said rib and groove elements in exact opposing alignment immediately after they are separated and while traveling over the separating finger;

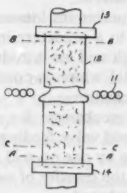
and a heat sealing means positioned immediately after the separating finger intermittently pressing the layers together transversely joining the rib and groove profile elements and heat sealing said layers and profiles by applying heat thereto, said heat sealing means moved intermittently against the bag film at spaced locations to form a cross seal at spaced locations on the film with the rib and groove elements remaining separated between said spaced locations.

4,094,730

METHOD FOR FABRICATION OF HIGH MINORITY CARRIER LIFETIME, LOW TO MODERATE RESISTIVITY, SINGLE CRYSTAL SILICON

W. Patrick Rahilly, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 11, 1977, Ser. No. 776,803
Int. Cl.[2] B01J *17/40*
U.S. Cl. 156—606 **2 Claims**



1. The method of fabricating a doped silicon single crystal of semiconductor material from a polycrystalline ingot rod of silicon, comprising the steps of:

a. refining the said polycrystalline ingot by a plurality of zone melt passes moving impurities to an upper end and a lower end of the ingot;

b. removing the said lower end of the said crystal providing a new clean end;

c. implanting near the new clean end a dopant on the said polycrystalline rod by ion beam implantation;

d. fusing a single crystal seed crystal to the said clean end;

e. converting the said polycrystalline rod ingot to single crystal structure by a single crystal zone melt pass through the said seed crystal and the said polycrystalline ingot, stopping the said zone melt pass before reaching the said upper end of the ingot; and

f. removing the upper end of the ingot providing a clean doped single crystal for semiconductor element fabrication.

4,094,731

METHOD OF PURIFYING SILICON

Naaman H. Keyser, Hinsdale, Ill., and James C. Cline, Beverly, Ohio, assignors to Interlake, Inc., Chicago, Ill.

Filed Jun. 21, 1976, Ser. No. 697,865
Int. Cl. C01b *33/02*; B01j *17/08*
U.S. Cl. 156—616 R **11 Claims**

1. A batch method of producing crystalline silicon having an iron concentration less than about one-twentieth of the iron concentration of the mother liquor, said method comprising introducing a molten mother liquor of silicon contaminated with iron at a temperature higher than the melting point of pure silicon into a ladle-shaped mold having a bottom and side walls, maintaining the mold at a temperature sufficient to cause silicon crystals to grow thereon, providing relative movement between the mold wall with the growing silicon crystals and the molten mother liquor to continuously wash the exposed growing surfaces of the silicon crystals with the mother liquor during the further growth of the silicon crystals and maintaining the top surface thereof substantially liquid by providing relative movement between the mold with the silicon crystals thereon and the molten mother liquor, decanting the mother liquor from the mold before the liquor temperature reaches 2206° F. to leave a hollow ladle-shaped silicon ingot of less than about 60% by weight of the original mother liquor having an outer zone adjacent to the mold and an inner zone centrally of said silicon ladle-shaped ingot, both the outer and inner zones having more than one-twentieth of the iron concentration of the mother liquor, and discarding the outer and inner zones to leave an annular crystalline portion of the silicon ingot with an iron concentration less than about one-twentieth of the iron concentration in the original mother liquor.

4,094,732

SILICON ETCHING PROCESS

Alan R. Reinberg, Dallas, and Rao K. Rao, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 628,184, Nov. 3, 1975. This application May 26, 1977, Ser. No. 800,826
Int. Cl.[2] H01L *21/306*
U.S. Cl. 156—643 **5 Claims**

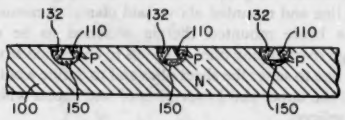
1. A process for etching silicon comprising the step of: contacting said silicon with a plasma derived from a gas comprising CCl_4 and an inert gas.

4,094,733

METHOD OF NEUTRALIZING LOCAL DEFECTS IN CHARGE COUPLE DEVICE STRUCTURES

Robert C. Gallagher, Ellicott City, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 16, 1976, Ser. No. 742,315
Int. Cl.[2] H01L *21/306*
U.S. Cl. 156—648 **6 Claims**



1. A method of preventing charge leakages in potential wells of a charge coupled device which are caused by defects located in a semiconductor substrate in which the potential wells are formed and which defects may intersect the potential wells, the method comprising:

diffusing a dopant of a second conductivity into a semiconductor substrate having a continuous surface to provide a first diffused region of approximately uniform depth and second deeper diffused regions surrounding any defect in said substrate; and

removing only said first diffused region from said substrate, said substrate having said second diffused regions surrounding any defects in order to neutralize the effect of any of said defects in the substrate in which the potential wells are to be formed.

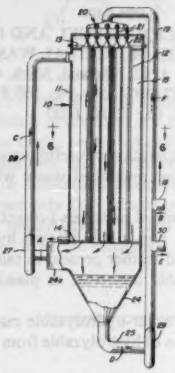
4. A method in accordance with claim 1 wherein said step of removing said first diffused region is achieved by chemical etching.

4,094,734

EVAPORATOR AND TREATMENT OF VISCOUS BRINES

George L. Henderson, Seattle, Wash., assignor to Henderson Industrial Corporation, Seattle, Wash.

Filed Oct. 15, 1973, Ser. No. 406,635
Int. Cl.[2] B01D *1/22*
U.S. Cl. 159—13 A 10 Claims



1. An evaporator for concentrating a liquid comprising: a vertically disposed shell, a bundle of parallel open-ended tubes vertically disposed within said shell, said tubes being sealed to a tube sheet at their upper and lower ends to define a steam chamber for heating said tubes, said tubes carrying trap means on the exterior thereof for receiving condensate and for removing the same from said steam chamber, a lower casing positioned beneath said tubes to receive steam and liquid concentrate from said tubes, means in said lower casing for separating said liquid concentrate from said steam, means to withdraw said steam from said lower casing, means to supply heated steam to the upper end of said steam chamber, means to withdraw said liquid concentrate from said lower casing and to pump the same at high velocity through a pipeline toward said tubes at the upper end thereof, header means including distributor arms to distribute the said liquid concentrate to a plurality of feed tubes, one for each of said open-ended tubes, said distributor arms having a graduated internal cross section and said feed tubes having a total internal cross-sectional area substantially equal to the internal cross section of the line through which said liquid concentrate is pumped to maintain the velocity substantially constant throughout said header means.

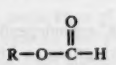
4,094,735

METHOD OF PULPING WITH SULFITE LIQUOR CONTAINING FORMIC ACID ESTERS

Sigbjorn P. H. E. Holgersson, Gavle, Sweden, assignor to Kopparfors AB, Ockelbo, Sweden

Continuation of Ser. No. 610,075, Sep. 3, 1975, abandoned. This application Jan. 17, 1977, Ser. No. 759,744
Claims priority, application Sweden, Sep. 6, 1974, 7411268
Int. Cl.[2] D21C *3/04, 3/06, 3/20*
U.S. Cl. 162—76 3 Claims

1. In the method of producing wood pulp by cooking wood in a sulfite cooking liquid, the improvement comprising adding to said sulfite cooking liquid, prior to bringing it into contact with the wood, at least one formic acid ester having the formula



where R is a hexyl group or an unsubstituted or methyl-substituted norbornyl group, in an amount of from 0.02 to 71 moles of ester per ton of absolutely dry wood and from 0 to 25% by weight of formic acid based on the weight of the added ester and cooking the wood with said cooking liquid to produce a pulp of increased yield and strength.

4,094,736

PREPARATION OF CELLULOSIC MATERIALS

Peter James Malden, Lostwithiel, England, assignor to English Clays Lovering Pochin & Company Limited, St. Austell, England

Filed Jun. 21, 1977, Ser. No. 808,529
Claims priority, application United Kingdom, Jun. 23, 1976, 26007/76
Int. Cl.[2] D21H *3/28, 3/66*
U.S. Cl. 162—175 24 Claims

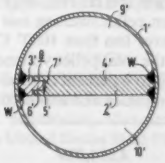
1. A process for preparing paper or cardboard which contains a filler composition, which process comprises the steps of (a) suspending raw starch in sufficient cold water to form a suspension containing about 3 to 10% by weight of starch solids; (b) heating the suspension thus obtained, with stirring, to a temperature in the range 75°–95° C; (c) adding a starch phosphate to sufficient water so as to form a suspension or solution containing about 1–10% by weight of the starch phosphate; (d) adding the starch phosphate solution or suspension to the suspension of raw starch and raising the temperature of the mixture thus obtained to within the range of 75°–95° C. and holding its temperature at that level for about 5 to 10 minutes; (e) agitating the solution of mixed starches thus obtained in a high shear mixer for from about 1 to 5 minutes and thereafter allowing the mixed starch solution to cool; (f) adding the cooled mixed starch solution to a dry powdered mineral filler material so that the resultant mixed suspension contains about 5–25% dry weight of the starch mixture and about 95–75% by weight of dry mineral; (g) adding the mixed suspension thus obtained to a suspension of cellulosic fibres, coagulating the mixed starches by adding a solution of a salt having a multivalent cation and thereafter raising the pH of the suspension to above 5.5; and (h) forming the suspension of cellulosic fibres containing the mixture of mineral and coagulated mixed starches into sheet material.

4,094,737

PRESSURIZED-WATER REACTOR INSTALLATION

Christoph Greischel, Erlangen; Elmar Harand, Hochstadt; Franz Maritsch, and Eberhard Michel, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Apr. 14, 1977, Ser. No. 787,443
Claims priority, application Germany, Apr. 30, 1976, 2619353
Int. Cl.[2] G21C *19/28*
U.S. Cl. 176—65 10 Claims



1. A pressurized-water reactor installation comprising a vertical reactor pressure vessel with an upper portion having at least one coolant connection with a horizontal dividing wall, said vessel internally having means for conducting coolant from below said wall downwardly into the vessel and then upwardly for discharge above the wall, a coolant pipe connected to and extending from the vessel's said connection and containing a horizontal partition wall extending throughout its length and connected with said dividing wall of the vessel's

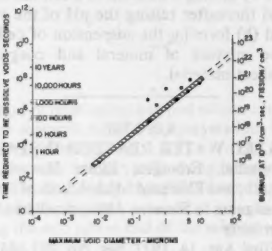
connection, a vertical steam generator positioned adjacent to said vessel, said generator having a lower portion having a coolant connection with which said pipe is connected and internally having a horizontal tube sheet above the generator's said connection and a horizontal partition below the tube sheet and horizontally aligned with and connected with the pipe's said horizontal partition wall and having a vertical partition wall extending upwardly to said tube sheet transversely with respect to the generator's said connection and forming horizontally separated spaces below the tube sheet and above the generator's horizontal partition, one of said spaces being adjacent to and connected to said pipe above its said horizontal partition wall, the generator's said horizontal partition forming a lower space therebelow, a vertical coolant pump vertically positioned in said lower space and discharging thereinto and having a suction inlet connected to the other of said spaces, said lower space being connected with said pipe below its said partition wall, and a vertical motor for driving said pump and positioned below and outside of the generator's said lower portion, a vertical shaft extending through said lower portion and interconnecting said motor and pump; wherein the improvement comprises said horizontal partition wall at least adjacent to said coolant connection being formed by at least two sections extending radially from the inside of said coolant pipe towards each other and having outer edges rigidly fixed to said inside and inner edges spaced from each other and interconnected by an expansion joint.

4,094,738

NUCLEAR FUEL PELLET DESIGN TO MINIMIZE DIMENSIONAL CHANGES

Walston Chubb, Franklin Township, Westmoreland County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1976, Ser. No. 687,838
Int. Cl.[2] G21C *3/06*
U.S. Cl. 176—67 **7 Claims**



1. A nuclear fuel pellet for use in a nuclear reactor, said fuel pellet consisting essentially of uranium dioxide and plutonium dioxide and having pores therein randomly distributed to provide a balance between pellet swelling and pore removal at a plurality of temperatures less than 1000° C, said pores being less than 1 percent of the total pellet volume for pore sizes less than 2 microns, and up to 6 percent of total pellet volumes for pore sizes between 0 microns and about 20 microns.

4,094,739

METHOD FOR PURIFYING MICROBIAL POLYSACCHARIDES

Calvin William Schroeck, Eastlake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Dec. 27, 1976, Ser. No. 754,866
Int. Cl.[2] C12D *13/04*
U.S. Cl. 195—7 **9 Claims**

1. A method for removing bacterial cells from an aqueous mixture comprising a polysaccharide produced by bacterial fermentation which comprises the steps of killing said bacterial cells and causing said mixture to undergo a second fermentation with a Trichoderma sp. mold, said second fermentation being continued for a period of time adequate to effect solubilization of said killed cells.

4,094,740

PREPARATION OF LIQUID FUEL AND NUTRIENTS FROM SOLID MUNICIPAL WASTE

John L. Lang, P.O. Box 1242, Midland, Mich. 48640

Filed Sep. 27, 1974, Ser. No. 509,812
Int. Cl.[2] C12C *1/00*
U.S. Cl. 195—27 **8 Claims**

1. The process for preparation of useful materials, including liquid fuels, from solidous municipal waste which comprises the steps of :

(a) Separation of the metal materials present in said waste;
(b) Separation of the non-friable plastic, hydrocarbon impregnated paper and leather present in said waste;
(c) Separation of friable materials, as plastics, glass, bone from said waste;
(d) Steeping to swell water-hydrolyzable material;
(e) Flotation separation of hydrolyzable from nonhydrolyzable material;
(f) Fine grinding of the hydrolyzable material;
(g) acidcatalyzed hydrolysis and saccharification of at least part of the hydrolyzable material to form fermentable sugars;
(h) Filtration of solublized material of step (g), with recycle of the non-solubles to the hydrolysis step and transfer of the solublized material to the fermentation step;
(i) pH adjustment to about 3.4 and fermentation;
(j) Filtration of the fermented mixture, recycling of solid material to the hydrolysis step;
(k) Distillation to produce (I) Liquid Fuel and (II) Residue suitable for use as plant- and animal-nutrients.

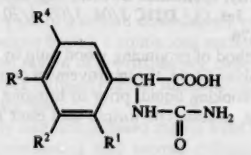
4,094,741

PROCESS FOR PREPARING D-(−)-N-CARBAMOYL-2-(PHENYL OR SUBSTITUTED PHENYL)GLYCINES

Hideaki Yamada, Kyoto; Satomi Takahashi, Takatsuki, and Koji Yoneda, Amagasaki, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

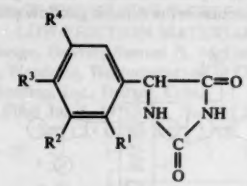
Filed Feb. 1, 1977, Ser. No. 764,635
Claims priority, application Japan, Feb. 4, 1976, 51-11575; Dec. 3, 1976, 51-145748
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—29 **13 Claims**

1. A process for preparing D-(−)-N-carbamoyl-2-(phenyl or substituted phenyl)glycines having the following general formula:



wherein R^1, R^2, R^3 and R^4 are independently hydrogen atom, a halogen atom, hydroxyl group, a lower alkoxyl group or methyl group,

which comprises subjecting 5-(phenyl or substituted phenyl)hydantoins having the following general formula:



wherein R^1, R^2, R^3 and R^4 are as defined above to the action of an enzyme which is in the form of a cultured broth containing microorganisms or the separated cells of said microorganisms in an aqueous medium, said enzyme being capable of hydrolyzing 5-(phenyl or substituted phenyl)hydantoins so as to substantially produce only D-(−)forms of N-carbamoyl-2-(phenyl or substituted phenyl)-glycines, and recovering said D-carbamoyl glycines from the medium.

4,094,742

PRODUCTION OF ETHANOL FROM CELLULOSE USING A THERMOPHILIC MIXED CULTURE

Winthrop D. Bellamy, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 4, 1977, Ser. No. 774,380
Int. Cl.² C12C *11/38*
U.S. Cl. 195—33 10 Claims

1. A process for fermenting cellulose to produce ethanol by the combined growth of a mixed culture of thermophilic cellulolytic gram-negative sporocytophaga and thermophilic ethanol-producing gram-positive bacillus said thermophilic cellulolytic gram-negative sporocytophaga always being associated with a gram-positive thermophilic bacillus, which comprises providing a particulate or fibrous cellulosic material wherein at least a major amount of the cellulose component is exposed, admixing an aqueous nutrient mineral broth with said particulate cellulosic material to form a suspension having a pH ranging from about 7 to 8, said aqueous nutrient mineral broth being a source of nutrients for said mixed culture, admixing said mixed culture with said suspension, and fermenting the resulting mixture at a temperature ranging from about 50° C to about 65° C and at a pH of about 7 to 8 to produce at least a significant amount of ethanol and recovering said ethanol.

4,094,743

ENZYMES IMMOBILIZED ON CHITOSAN

Jean-Louis Leuba, Crissier, Switzerland, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., La Tour-de-Peilz, Switzerland

Filed Apr. 1, 1976, Ser. No. 672,790
Claims priority, application Switzerland, Apr. 10, 1975, 4546/75
Int. Cl.² C07G *7/02*
U.S. Cl. 195—63 18 Claims

1. A process for the preparation of an enzymatically active product insoluble in aqueous medium, comprising treating chitosan as an insoluble inert support with a dialdehyde to provide an activated chitosan support and thereafter fixing an enzyme containing free amino groups to said activated chitosan support.

4,094,744

WATER-DISPERSIBLE PROTEIN/POLYURETHANE REACTION PRODUCT

Frank Joseph Hartdegen, Columbia, and Wayne Elliott Swann, Pasadena, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 743,035, Nov. 18, 1976, which is a continuation-in-part of Ser. No. 660,982, Feb. 24, 1976, abandoned, which is a continuation-in-part of Ser. No. 585,674, Jun. 10, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,430
Int. Cl.² C07G *7/02*
U.S. Cl. 195—63 19 Claims

8. An aqueous solution of a water-dispersible, biologically-active protein bound to a polyurethane characterized as having an essentially linear polyester backbone, said protein bound to said polyurethane through a ureido linkage, said polyurethane-bound protein being water-soluble.

10. A method for preparing an aqueous solution of protein bound to a urethane polymer comprising:

a. admixing a water-dispersible, biologically-active protein and an isocyanate-capped liquid polyurethane prepolymer having a linear polyester backbone under essentially anhydrous conditions to form a solution, said protein and prepolymer reacting to form a water-soluble reaction product wherein the protein and prepolymer are bound together; and

b. dispersing the solution in water with agitation to form an aqueous solution of urethane-polymer bound protein.

4,094,745

METHOD OF STAINING MICROSCOPIC ORGANISMS

John Scholefield, Glenesk, Moor Road, Milngavie, Glasgow, Scotland

Continuation-in-part of Ser. No. 479,583, Jun. 14, 1974, abandoned. This application Jun. 30, 1976, Ser. No. 701,083
Claims priority, application United Kingdom, Jun. 22, 1973, 29674/73
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 M 10 Claims

1. A method of staining viable microorganisms or a mixture of viable and of non-viable microorganisms comprising reacting said microorganisms, suspended in a liquid medium, with phosphate ions, whereby phosphate ions react at active sites on the microorganisms to produce phosphate derivatives of the microorganisms having, at said sites, polydentate phosphate groups, reacting the phosphate derivatives with a phosphate-reactive fluorochrome dye, which thereby combines chemically with the microorganisms via the intermediate phosphate groups, and examining the thus-fluorochrome-dyed microorganisms with fluorescence-activating ultraviolet light for the presence, relative amounts or numbers of viable and non-viable microorganisms suspended in the liquid medium.

4,094,746

COAL-CONVERSION PROCESS

Philip X. Masciantonio, Penn Township, Westmoreland County, and Kenneth A. Schowalter, Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

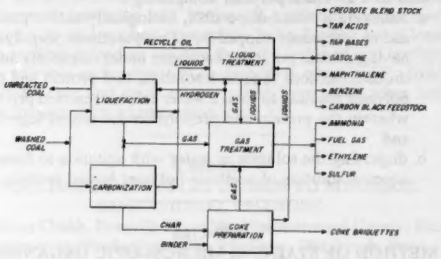
Continuation of Ser. No. 205,248, Dec. 6, 1971, abandoned. This application Nov. 25, 1974, Ser. No. 526,481
Int. Cl.² C10B *49/16, 55/02*
U.S. Cl. 201—5 7 Claims

1. A method for the economical conversion of high sulfur coal to conversion products for the production of metallurgical grade coke and low sulfur gaseous and liquid fuels, wherein coal carbonization and liquefaction processes are integrated to treat particulate, high sulfur coal containing from about 1 to 5% sulfur, said method comprising,

(a) in a fluidized bed reaction zone maintained at a carbonizing temperature not greater than 1600° F, contacting a

first quantity of said particulate coal with (i) an amount of char at least sufficient to maintain the free flow of the bed of coal particles and (ii) a gas containing at least an amount of H_2 sufficient to yield a resultant low sulfur char containing less than 0.7% sulfur, said gas having no more than about 2% by volume H_2S and being substantially free of O_2; the resultant carbonization reaction producing, in addition to said low sulfur char, gaseous effluents, and liquid effluents including tar acids and hydrocarbon oils,

(b) in a liquefaction reaction zone maintained at a temperature of about 800° to 960° F and a pressure of 2000 to 10,000 psi, combining a second quantity of said particulate coal with carrier oil, a substantial portion of which is hydrocarbon middle oil derived from step (e), and reacting the combination in the presence of H_2 to render said second coal quantity into gaseous effluents, and liquid effluents including light-, middle-, and heavy-hydrocarbon oils,



(c) recovering low sulfur char product and the gaseous and liquid effluents from steps (a) and (b),

(d) recovering H_2 from said gaseous effluents and passing at least a portion of the recovered H_2 to said liquefaction reaction zone to satisfy the H_2 demands thereof,

(e) recovering said hydrocarbon middle oil and passing at least a portion thereof to said liquefaction reaction zone to satisfy the carrier oil demands thereof, said hydrocarbon middle oil containing tar acids from said carbonization reaction for the promotion of said liquefaction reaction,

(f) proportioning the ratios of coal fed to steps (a) and (b) so that said first quantity is between 30 and 65% of the sum of said first and second quantities; whereby heavy-hydrocarbon oil is produced in a quantity at least sufficient to serve as binder, for the low sulfur char recovered as product, in the formation of a green coke material, which, upon calcination at temperatures of 1500° to 2400° F will produce a metallurgical grade coke containing less than 0.7% S.

4,094,747

THERMAL POWER STATION COMBINED WITH A PLANT FOR SEAWATER DESALINATION

Hans Pfenninger, Baden, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

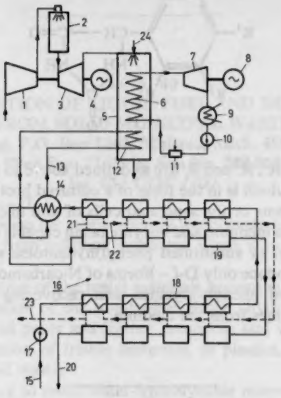
Filed Apr. 12, 1977, Ser. No. 786,870

Claims priority, application Switzerland, May 14, 1976, 6052/76

Int. Cl.² B01D *3/02*

U.S. Cl. 202—173 **5 Claims**

1. A combined thermal power station and a desalination plant for seawater wherein said thermal power station comprises a gas turbine set which includes a compressor and gas turbine with a combustor therebetween, a steam turbine, and a waste heat boiler connected to and which receives hot exhaust gas from said gas turbine, said waste heat boiler comprising on the water side first and second sections connected in cascade relative to the flow path of the hot exhaust gas through said boiler, the first section in the exhaust gas flow path constituting



a steam generator for said steam turbine and the second section constituting a source of heat utilized in the desalination plant.

4,094,748

METHOD OF AND DEVICE FOR DISTILLING OFF SECONDARY SUBSTANCES FROM OILY LIQUIDS

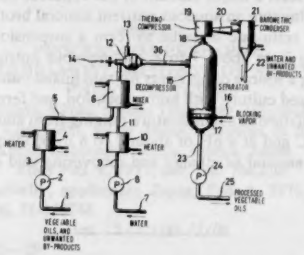
Heinz Schumacher, Hoperfeld 26, D-2050, Hamburg 80, Germany

Filed Jun. 11, 1976, Ser. No. 695,502

Claims priority, application Germany, Jun. 16, 1975, 2526944

Int. Cl.² B01D *3/06, 3/38;* C11B *3/14*

U.S. Cl. 203—88 **9 Claims**



1. A method of distilling off unwanted by-products from an oily liquid by means of steam, the vaporization points of the by-products and of the steam lying below that of the oily liquid, comprising:

heating and pressurizing said oily liquid and said steam;

mixing said oily liquid and said steam in a contactor;

spontaneously decompressing said mixture in a decompressor to a pressure considerably below the pressure in said contactor, causing said mixture to decompose into a purified liquid phase of said oil and a vapor phase of said steam and said by-products, said steam and said by-products having absorbed their heats of vaporization from the heat of the oily liquid; and separating said vapor from said purified liquid in a separator under a separation pressure which lies considerably below the pressure obtaining in the contactor.

4,094,749
SURFACE TREATMENT WITH DURABLE LOW-FRICTION MATERIAL

Ronald R. Stange, Denver; Samuel B. McGuire, Arvada, and Thomas W. Woodring, Westminster, all of Colo., assignors to Tools for Bending, Inc., Denver, Colo.

Filed Jul. 6, 1976, Ser. No. 702,333
Int. Cl.² C25D *5/00, 5/48*
U.S. Cl. 204—25 **11 Claims**

1. The method of plating a metal surface comprising the steps of:
(a) cleaning the metal surface;
(b) electroplating the surface with chromium in a chromic acid bath to form a microcracked chromium plated surface portion;
(c) heating the plated surface to oxidize the external surface thereof;
(d) etching the plated surface to expand the cracks formed in the plating step; and
(e) followed by applying a perfluorocarbon composition under pressure to fill the microcracks.

11. The method of forming a lubricant surface on a tube bending mandrel assembly which is comprised of a plurality of interconnected metal balls and a shank portion at one end comprising the steps of:
(a) cleaning the external surfaces of the metal balls and shank;
(b) electroplating the external surfaces in a chromic acid bath for a time period and at a temperature level sufficient to form a hard chromium plated surface containing microcracks therein;
(c) heating the metal balls and shank at a temperature and for a time period sufficient to oxidize the plated surface thereof;
(d) reverse etching the metal balls and shank to expand the cracks formed in the plating surface; and
(e) applying a polytetrafluoroethylene to the external plated surfaces of the metal balls and shank at an elevated temperature sufficient to cause the polytetrafluoroethylene to fuse into and to fill the microcracks formed in the plated surface portions.

4,094,750
CATHODIC DEPOSITION OF OXIDE COATINGS

Jack D. Mackey, El Segundo, Calif., assignor to Northrop Corporation, Los Angeles, Calif.

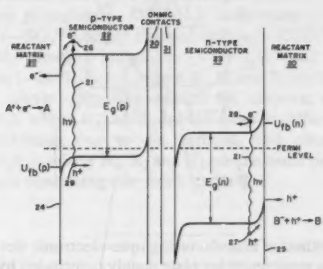
Filed Oct. 5, 1977, Ser. No. 839,581
Int. Cl.² C25D *9/12*
U.S. Cl. 204—56 R **6 Claims**

1. A process for depositing a tenaceous, adhesion-promoting oxide coating on the surface of a metal part, comprising: cleaning the surfaces of said part, suspending said part as the cathode in a solution containing isoproponol and a metal salt selected from the group consisting essentially of aluminum nitrate, cupric nitrate, cobalt nitrate, and nickelous nitrate, electrolyzing said part at a current density ranging from 0.02 to 0.5 amp./in.² for times ranging from 5–60 seconds.

4,094,751
PHOTOCHEMICAL DIODES

Arthur J. Nozik, Summit, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Sep. 30, 1976, Ser. No. 728,474
Int. Cl.² C25B *1/00, 1/04*
U.S. Cl. 204—80 **40 Claims**



1. A photochemical diode comprising two portions, a first portion comprising at least one appropriately doped *p*-type semiconductor material provided with an ohmic contact over a portion thereof and a second portion comprising at least one appropriately doped *n*-type semiconductor material provided with an ohmic contact over a portion thereof and joined to said first portion through both said ohmic contacts.

5. A process for converting optical energy into chemical energy to drive a chemical reaction in a matrix of chemical reactants which comprises suspending an assembly of discrete photochemical diodes in the reactant matrix and illuminating the diodes with optical energy, the diodes each comprising two portions, a first portion comprising at least one appropriately doped semiconductor material of a given conductivity type and provided with an ohmic contact over a portion thereof, and a second portion comprising either metal which is joined to said first portion through said ohmic contact or at least one appropriately doped semiconductor material of a given conductivity type opposite to that of said first portion, provided with an ohmic contact over a portion thereof and joined to said first portion through both said ohmic contacts.

9. The process of claim 5 in which the chemical reaction comprises photolytic decomposition of water into hydrogen plus at least one of oxygen and hydrogen peroxide.

10. The process of claim 5 in which the chemical reaction comprises photolytic decomposition of hydrogen sulfide into hydrogen plus zero-valence sulfur.

25. A process for generating hydrogen from a portion of a body of water using solar radiation comprising
suspending an assembly of discrete photochemical diodes in the water, the photochemical diodes comprising two portions, a first portion comprising at least one appropriately doped semiconductor material of a given conductivity type and provided with an ohmic contact over a portion thereof and a second portion comprising either metal which is joined to said first portion through said ohmic contact or at least one appropriately doped semiconductor material of a conductivity type opposite to that of said first portion, provided with an ohmic contact over a portion thereof and joined to said first portion through both said ohmic contacts,

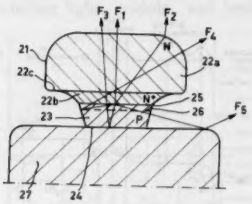
confining the diodes to a fixed volume element by membranes permeable to the water and impermeable to the diodes, and

collecting evolved hydrogen in a space above the water formed by a transparent polymer film.

4,094,752
METHOD OF MANUFACTURING OPTO-ELECTRONIC DEVICES

Jacques Vahe, Aunay, Odon, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,901
Claims priority, application France, Dec. 9, 1974, 74 40216
Int. Cl.[2] H01L *21/306*
U.S. Cl. 204—129.95 **16 Claims**



1. A method of manufacturing opto-electronic devices starting from a semiconductor plate mainly constituted by stratified layers of gallium aluminum arsenide of the general formula $AsAl_xGa_{1-x}$ in which the molar proportion x of aluminum is lower than 0.3, wherein an etching treatment is carried out on said plate in a bath containing hydrofluoric acid, nitric acid and acetic acid for a time sufficient to obtain a desired configuration.

4,094,753
RECOVERY OF GALLIUM FROM GALLIUM COMPOUNDS

Thomas L. Charlton, Rossland, and Robert F. Redden, Fruitvale, Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Jun. 1, 1977, Ser. No. 802,405
Int. Cl.[2] C25C *1/00*; C01F *1/00*
U.S. Cl. 204—105 R **25 Claims**

1. A process for the recovery of gallium from gallium compounds containing at least one element selected from the group consisting of antimony, arsenic and phosphorus which comprises the steps of:

(i) leaching said gallium compounds with an oxidizing agent selected from nitric acid and a combination of nitric acid and hydrogen peroxide, said oxidizing agent being added in an amount at least sufficient to dissolve said gallium from said gallium compounds to form a gallium-containing solution;

(ii) forming a gallate solution from said gallium-containing solution; and

(iii) recovering gallium from said gallate solution.

4,094,754
LEACHING OF NI-CU-FE-S MATTE

Raymond D. Symens, Arvada; Paul B. Queneau, Golden; Eddie C. J. Chou, Arvada, and Franklin F. Clark, Golden, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Mar. 7, 1977, Ser. No. 775,169
Int. Cl.[2] C25C *1/12*
U.S. Cl. 204—108 **14 Claims**

3. A method of controlling the atmospheric leaching kinetics of comminuted nickeliferous sulfide matte containing about 20% to 75% nickel, about 5% to 50% copper, non-stoichiometric sulfur in the range of about 13% to 16% and over 0.5% to about 8% iron, the sum of the nickel, copper and sulfur contents being at least about 80%, and thereby selectively effect the rapid dissolution of substantial amounts of nickel from said matte and leave a residue impoverished in said nickel, which comprises,

providing said matte in particulate leachable form,

subjecting said particulate matte to atmospheric leaching under oxidizing conditions in a confined column of sulfuric acid-copper sulfate solution containing about 10 gpl to 200 gpl H_2SO_4 and 5 gpl to 100 gpl copper, with the mole ratio of H_2SO_4 to copper in said leach solution ranging from about 0.5:1 to 2.5:1 and the temperature from about 50° C to 100° C, the amount of solution being such as to provide about 0.4 to 0.8 mole of said H_2SO_4 plus copper in said solution for each mole of nickel in said matte while injecting a flow of air into the bottom of said solution column at a rate and a partial pressure of oxygen sufficient to sustain said rapid dissolution of nickel,

selectively controlling the kinetics of said leaching to effect rapid dissolution of substantial amounts of nickel from said matte while controlling the residual amounts of copper and iron in the final pregnant solution to below predetermined amounts:

(1) such that to obtain a final nickel solution containing less than about 20 ppm copper and less than about 100 ppm iron, the acid-to-copper mole ratio is controlled to at least about 1.5:1 at a temperature of over about 75° C. and

(2) such that to obtain a final nickel solution containing less than 20 ppm copper and less than about 20 ppm iron, the acid-to-copper mole ratio is controlled at less than about 1.5:1 at a temperature of less than about 70° C.

4. The method of claim 3, wherein following the completion of said atmospheric leach, the residue thereof is subjected to sulfuric acid leaching using air as an oxidant at elevated temperature and pressure to dissolve the metal values nickel and copper therein, and the solution then subjected to copper electrowinning to produce electrolytic copper and a spent sulfuric acid-copper sulfate electrolyte, the spent electrolyte providing solution for use in the atmospheric leaching of said matte.

5. A method of controlling the atmospheric leaching kinetics of comminuted nickeliferous sulfide matte containing about 20% to 75% nickel, about 5% to 50% copper, non-stoichiometric sulfur in the range of about 17% to 23% and over 0.5% to about 8% iron, the sum of the nickel, copper and sulfur contents being at least about 80% and thereby selectively effect the rapid dissolution of substantial amounts of nickel from said matte and leave a residue impoverished in nickel, which comprises,

providing said matte in particulate leachable form,

subjecting said particulate matte to atmospheric leaching under oxidizing conditions in a confined column of sulfuric acid-copper sulfate solution containing about 10 gpl to 200 gpl H_2SO_4 and 5 gpl to 100 gpl copper, with the mole ratio of H_2SO_4-to-copper ranging from about 0.5:1 to 2.5:1 and the temperature from about 50° C to 100° C while injecting a flow of air into the bottom of said solution column at a rate and a partial pressure of oxygen sufficient to sustain said rapid dissolution of nickel,

selectively controlling the conditions of leaching to effect rapid dissolution of substantial amounts of nickel from said matte by:

adjusting the ratio of leach solution to matte so as to provide about 0.4 to 0.8 mole of said H_2SO_4 plus copper in said solution for each mole of nickel in said matte,

adjusting the mole ratio of H_2SO_4-to-copper in said solution to at least about 1.8 at a temperature of over about 75° C,

and continuing the leaching of said matte under said controlled conditions to decrease the copper and/or iron in said solution to below 20 ppm.

4,094,755

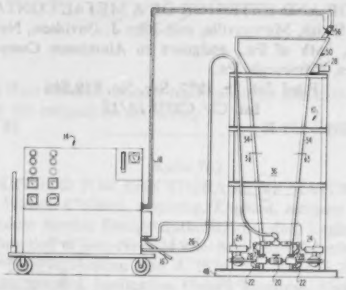
WATER PURIFICATION METHOD

Karl Moeglich, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Gateway Center, Pa.

Continuation-in-part of Ser. No. 613,289, Sep. 15, 1975, abandoned, which is a continuation of Ser. No. 487,730, Jul. 11, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,790

Int. Cl.[2] C25B *1/30;* C02C *5/12*

U.S. Cl. 204—149 39 Claims



1. A continuous method for agglomerating solids of colloidal size or larger suspended in aqueous media comprising:

providing at least a pair of metal electrodes having facing surface areas substantially closely spaced with respect to one another;

causing said media and suspended solids to continuously flow between and past the facing surfaces of said spaced electrodes;

causing said suspended solids to agglomerate by applying an alternating (AC) voltage at a frequency between about 0.2 Hz and 800 Hz across said electrodes while

controlling said AC voltage in relation to the spacing between said electrode surface areas and the conductivity of said media so as to provide an alternating electric current flowing between said electrode surfaces with the value of said alternating current being between about 0.08 to 6.0 amperes per square inch of electrode surface to produce hydrogen peroxide at said surfaces as said aqueous media passes; and

providing fluid-induced agitation of said media so as to create turbulence of a Reynolds number of at least about 10,000 in said media as the same flows between and past the spaced facing surfaces of said electrodes whereby the suspending forces of said solids will be broken so that said solids will agglomerate for removal from said media.

4,094,756

PHOTOCHEMICAL MODIFICATION OF POLYMERS

Lynn J. Taylor, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

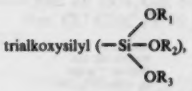
Continuation-in-part of Ser. No. 183,276, Sep. 23, 1971, abandoned. This application Dec. 29, 1975, Ser. No. 645,103

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.[2] C08F *8/18, 8/34*

U.S. Cl. 204—159.18 18 Claims

1. A process for preparing chemically modified polyolefins or olefin copolymers which comprises exposing to ultraviolet or visible radiation an intimately dispersed mixture containing a polyolefin or olefin copolymer, an organic sensitizer, and an organic co-reactant having a structure containing both a saturated aliphatic hydrocarbon residue and at least one highly polar functional group, said co-reactant being a non-polymeric organic compound having the generalized structure R—X, where R is a saturated linear, branched, or cyclic aliphatic hydrocarbon residue containing at least six carbon atoms, and X is at least one polar functional group selected from the group consisting of hydroxyl (—OH); carboxyl (—COOH); amide (—$CONH_2$); mono- and disubstituted amide (—$CONHR_1$ and —$CONR_1R_2$), where R_1 and R_2 are the same or different lower alkyls containing one to four carbons; amino (—NH_2); mono- and disubstituted amino (—NHR_1 and NR_1R_2), where R_1 and R_2 are the same or different lower alkyls containing one to four carbons;



trialkoxysilyl (—$Si(OR_1)(OR_2)(OR_3)$),

where R_1, R_2 and R_3 are lower alkyls containing one to four carbons; sulfonic acid (—SO_3H); hydrogen sulfate (—OSO_3H); dihydrogen phosphate (—OPO_3H_2); carboxylate (—$COO^{\ominus}$); sulfonate (—$SO_3^{\ominus}$): singly charged sulfate (—$OSO_3^{\ominus}$); singly and doubly charged phosphate (—$OPO_3H^{\ominus}$ and $OPO_3^{\ominus}$); ammonium (—$N^{\oplus}R_1R_2R_3$), where R_1, R_2 and R_3 are hydrogens or lower alkyls containing one to six carbons; sulfonium (—$S^{\oplus}R_1R_2$), where R_1 and R_2 are the same or different lower alkyls containing one to six carbons; and phosphonium (—$P^{\oplus}R_1R_2R_3$), where R_1, R_2 and R_3 are the same or different lower alkyls containing one to six carbons.

4,094,757

POLYTHIOL ACCELERATED RADIATION CROSSLINKING OF OLEFINICALLY UNSATURATED ALLYLICALLY HALOGENATED POLYMERS

Robert L. Zapp, Short Hills, and Alexis A. Oswald, Mountainside, both of N.J.

Continuation of Ser. No. 531,628, Dec. 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 232,275, Mar. 6, 1972, Pat. No. 3,864,229. This application Feb. 22, 1977, Ser. No. 770,457

Int. Cl.[2] B01J *1/10, 1/12*

U.S. Cl. 204—159.18 14 Claims

1. In a process for the curing of a polymer having a number average molecular weight of at least 50,000, using ionizing radiation, wherein said polymer has at least 0.5 mole % chlorine or bromine in an allylic position, the improvement which comprises incorporating into the polymer about 0.5 to 6 parts per hundred parts by weight of polymer of a cure enhancer comprising a hydrocarbon polythiol having a number average molecular weight of about 150 to about 3,000 and having at least three thiol groups.

4,094,758

PROCESS FOR PREPARING HIGHER OXIDES OF THE ALKALI AND ALKALINE EARTH METALS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Pasupati Sadhukhan, La Verne, and Alexis T. Bell, Oakland, both of Calif.

Filed Jan. 19, 1977, Ser. No. 760,810

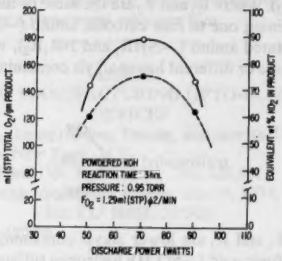
Int. Cl.[2] B01K *1/00;* C01D *1/02*

U.S. Cl. 204—164 6 Claims

1. A process for preparing the inorganic higher oxides of the alkali metals comprising:

(a) positioning the hydroxide of an alkali metal into a radio frequency discharge reactor in such a manner that about half of said hydroxide is within the glow discharge region of said reactor and the rest is outside of said region;

(b) introducing a flow of oxygen into said radio frequency discharge reactor;



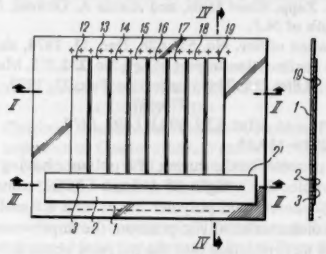
(c) establishing a glow discharge by applying between about 50 to 90 watts of power to the reactor until the higher oxide formation is completed.

4,094,759

METHOD FOR SIMULTANEOUS QUANTITATIVE ANALYSIS OF SEVERAL CONSTITUENTS IN A SAMPLE

Gerhard Ruhenstroth-Bauer, Grafelfing, and Reiner Scherer, Munich, both of Germany, assignors to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v., Gottingen, Germany

Division of Ser. No. 646,391, Jan. 2, 1976, Pat. No. 4,018,662. This application Jan. 12, 1977, Ser. No. 758,735
Claims priority, application Germany, Jan. 3, 1975, 2500218
Int. Cl.[2] G01N *27/26*
U.S. Cl. 204—180 G **10 Claims**



1. A method for the simultaneous qualitative and quantitative analysis of a plurality of immunoreactive substances, especially of antigen-effective substances contained in a sample, comprising the steps of:

A. placing the sample to be tested in a first carrier material which is free from antibodies;

B. providing a second carrier material, adjacent to said first carrier material, said second carrier material containing ingredients capable of undergoing immunoreactions with said substances in said sample, thereby forming precipitates;

C. causing the migration of said sample from said first carrier material into said second carrier material;

D. applying an electric field to the area of said first and second carriers for enhancing the migration of said sample from said first carrier material into said second carrier material substantially in the direction of said electric field; the improvement comprising the steps of:

E. providing a plurality of second carrier materials, simultaneously adjacent to said first carrier material, and

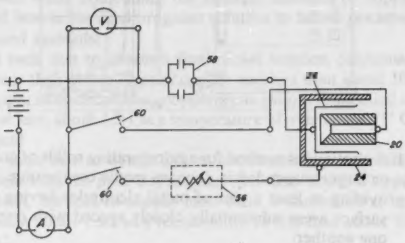
F. providing in each of said plurality of second carrier materials a different ingredient, each different ingredient being capable of undergoing a precipitate-forming immunoreaction with one of the substances to be analyzed in said sample.

4,094,760

METHOD AND APPARATUS FOR DIFFERENTIALLY AND SIMULTANEOUSLY ELECTROCOATING THE INTERIOR AND EXTERIOR OF A METAL CONTAINER

David A. Smith, Murrysville, and John J. Davidson, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 25, 1977, Ser. No. 818,846
Int. Cl.[2] C25D *13/12*
U.S. Cl. 204—181 R **18 Claims**



1. A method of simultaneously electrocoating the interior and exterior of a metal container, which comprises:

inserting a hollow electrically conductive probe into a container;

enclosing the container within an outer electrically conductive housing generally conforming to the container exterior shape;

sealing said outer housing with said probe to form a continuous passageway from said hollow probe to the interior of the container to the exterior of the container between the container and said outer housing;

flowing electrocoating material through said probe, said outer housing and said continuous passageway therebetween to flood the container in a transient bath of electrocoating material;

impressing an electrical potential between the container and said probe to electrocoat the interior of the container and simultaneously therewith impressing an electrical potential between the container and said outer housing to electrocoat the exterior of the container, said probe and said outer housing having the same electrical polarity.

4,094,761

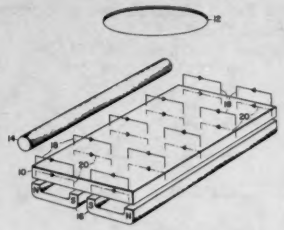
MAGNETION SPUTTERING OF FERROMAGNETIC MATERIAL

Richard W. Wilson, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 25, 1977, Ser. No. 818,681
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 M **1 Claim**

1. An improved method for producing a magnetron sputtered film having the properties of a ferromagnetic material wherein the improvement comprises using a cathode target

formed of said ferromagnetic material alloyed with a nonferromagnetic material to lower the Curie temperature of the alloy



to less than the temperature maintained by said cathode target during the magnetron sputtering.

4,094,762

METHOD FOR THE STORAGE OF MATERIAL

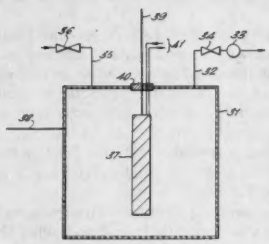
David Watson Clelland, Appleton, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 524,995, Nov. 18, 1974, abandoned. This application Nov. 4, 1975, Ser. No. 628,783

Claims priority, application United Kingdom, Nov. 5, 1974, 47792/74

Int. Cl.[2] C23C *15/00*; G21F *9/02*

U.S. Cl. 204—192 EC 6 Claims



1. A method for storage of a material comprising:

providing an electrical glow discharge device comprising a container for enclosing a gas atmosphere, said container including a wall forming a storage glow discharge electrode, and a sacrificial glow discharge electrode located within said container;

introducing into said container a gas atmosphere containing the material to be stored;

maintaining the pressure within said container at a value suitable for electrical glow discharge;

electrically energizing the storage and sacrificial glow discharge electrodes to effect glow discharge between the electrodes to ionize said material in said atmosphere;

controlling the electrical supply such that ions of said material bombard and are implanted into said wall forming said storage electrode and such that ions of said material also bombard said sacrificial electrode, the ion bombardment of said sacrificial electrode being sufficient to cause sputtering thereof such that the sputtered material is deposited on said wall forming said storage electrode;

whereby the thickness of said wall is increased and whereby ions of said material to be stored are implanted in the container wall of increased thickness such that said material is entrapped and stored therein.

2. A method according to claim 1 wherein said controlling of the electrical supply comprises adjusting at least one parameter of value, polarity and time of potential applied to a particular electrode.

4,094,763

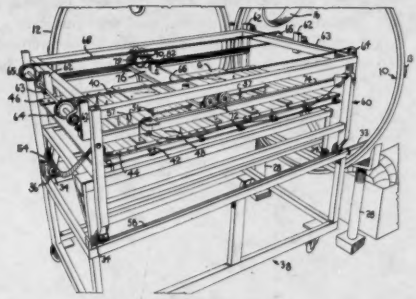
SPUTTER COATING OF GLASS WITH AN OXIDE OF A METAL HAVING AN ATOMIC NUMBER BETWEEN 48 AND 51 AND MIXTURES THEREOF

Frank H. Gillery, Allison Park; Jean P. Pressau, Evans City, and Robert E. Kubichan, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 241,858, Apr. 6, 1972, which is a continuation of Ser. No. 60,002, Jul. 31, 1970, abandoned. This application Jan. 23, 1974, Ser. No. 435,788

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—192 P 11 Claims



1. A method of applying a uniform, transparent electroconductive coating having an electrical resistance of less than about 10 ohms/square and a visible light transmittance of at least about 70 percent consisting essentially of the oxide of a metal taken from the class of metals having an atomic number between 48 and 51 and mixtures of said oxides on a ceramic substrate comprising,

supporting said ceramic substrate in a low pressure atmosphere not exceeding 10^{-1} torr and containing a mixture of oxygen and inert gas having an oxygen concentration of at least 1 percent while performing the steps of:

heating said substrate by applying heat throughout the area of said substrate from a radiant heat source spaced from and facing said substrate to heat said substrate to a temperature within the range of from 400° F. to a temperature at which the substrate becomes distorted,

cathode sputtering said oxide of metal onto said substrate when its temperature reaches at least 400° F.,

continuing to apply heat to said substrate to maintain its temperature at a preselected temperature within said temperature range while continuing said cathode sputtering until a film of desired thickness is formed, and

discontinuing said cathode sputtering when said film develops a desired electroconductivity.

4,094,764

DEVICE FOR CATHODIC SPUTTERING AT A HIGH DEPOSITION RATE

Bernard Boucher, Massy; Daniel Luzet, La Frette, and Claude Sella, Meudon-la-Foret, all of France, assignors to Commissariat a l'Energie Atomique, Paris and Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, both of, France

Filed Sep. 13, 1976, Ser. No. 722,472

Claims priority, application France, Sep. 19, 1975, 75 28778

Int. Cl.[2] C23C *15/00*

U.S. Cl. 204—298 1 Claim

1. A device for cathodic sputtering at a high deposition rate on a substrate comprising :

a pumped enclosure adapted to be at a low pressure *p* less than atmospheric pressure ;

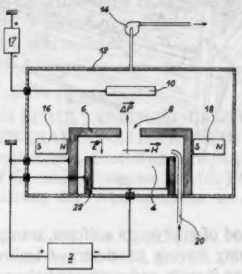
a cup-shaped anode within said enclosure, said anode having a circular bottom portion including a centered orifice;

a target within said enclosure, said target being positioned within said cup-shaped anode and having a single, flat sputtering surface defined by a perimetric edge, said surface being parallel to, opposed to, and spaced from said bottom portion;

means for providing a plasma creating electrical discharge between said target and said anode, said target being at a negative potential relative to said anode;

conduit means for admitting a gas at a high pressure P higher than said low pressure *p* into the space between said sputtering surface of said target and said bottom portion of said anode;

means within said enclosure for holding said substrate outside of said cup-shaped anode, said substrate being opposed to and spaced from said orifice, communication between said sputtering surface and said substrate being



established solely via said orifice, a high gas-pressure gradient P-*p* being established between said sputtering surface and said substrate;

means located externally of said anode for producing a magnetic field H of at least a kilogauss parallel to said sputtering surface of said target, said parallel magnetic field being substantially confined to the space between said sputtering surface and said bottom portion of said cup-shaped anode;

a suppressor screen place around said perimetric edge of said sputtering surface and spaced equidistantly therefrom, said suppressor screen around said perimetric edge being within said cup-shaped anode; and

means for bringing said substrate to a negative potential with respect to said anode wherein plasma is created by an arc imposed by static electrical potentials applied between said substrate and said anode.

4,094,765

COAL LIQUEFACTION PROCESS

Roby Bearden, Jr., and Clyde L. Aldridge, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 17, 1976, Ser. No. 751,385
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 **18 Claims**

1. A process for the liquefaction of coal, which comprises the steps of:

(a) treating a slurry comprising coal and a diluent with a hydrogen sulfide-containing gas at a temperature ranging from 100° to about 482° C. and a pressure ranging from atmospheric to about 5000 psig, and

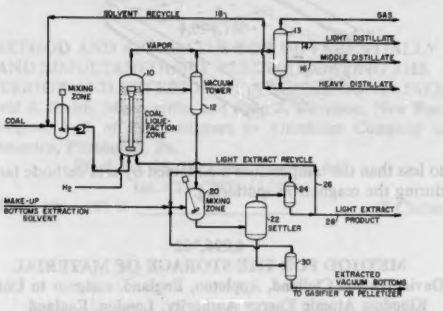
(b) subjecting at least a portion of the resulting product effluent to coal liquefaction conditions in a coal liquefaction zone, substantially all of said hydrogen sulfide being removed from the treated product effluent prior to step (b).

4,094,766

COAL LIQUEFACTION PRODUCT DEASHING PROCESS

Everett Gorin, San Rafael, Calif., assignor to Continental Oil Company, Stamford, Conn.

Filed Feb. 1, 1977, Ser. No. 764,617
Int. Cl.[2] C10G *1/08*
U.S. Cl. 208—10 **2 Claims**



1. In a coal liquefaction process which uses a distillable liquefaction solvent in the presence of hydrogen in a coal liquefaction zone, the improvement which comprises:

(a) establishing and maintaining conditions in said coal liquefaction zone effective to dissolve above 80 percent by weight of the m.a.f. coal and produce a major portion of the resulting coal liquefaction product as a distillable product,

(b) withdrawing an effluent slurry product from said liquefaction zone which contains distillable and non-distillable fractions, undissolved solids, and liquefaction solvent,

(c) subjecting said effluent slurry product to vacuum distillation to separately recover a distillable fraction composed of liquefaction solvent and distillable coal liquefaction products and a flowable bottoms fraction composed of non-distillable residuum, undissolved solids and residual liquefaction solvent,

(d) mixing said bottoms fraction with a fractionating solvent comprising a saturated hydrocarbon boiling above 150° C which preferentially dissolves the lower molecular weight part of the non-distillable residuum in a mixing zone which is maintained at a temperature above the liquefaction point of said bottoms fraction,

(e) conducting the resulting mixture from step (d) to a settler which is maintained at an elevated temperature to ensure fluidity of the mixture and the formation of two liquid phases, the upper layer being composed of the lower molecular weight oil dissolved in the fractionating solvent and the lower layer being the remainder of said mixture,

(f) separating the upper liquid phase from the lower liquid phase, and

(g) recovering said lower molecular weight oil from said upper liquid phase.

4,094,767

FLUIDIZED BED RETORTING OF TAR SANDS

Phillip H. Gifford, II, Carbondale, Colo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 10, 1976, Ser. No. 740,525
Int. Cl.[2] C10G *1/02*
U.S. Cl. 208—11 R **10 Claims**

1. A process for producing a raw oil from a tar sand containing bitumen, which comprises the steps of:

(a) preheating a tar sand containing bitumen by indirect heat exchange with hot off-gas stream as hereinafter recited in step (f).

(b) feeding said preheated tar sand from said step (a) containing bitumen into a fluidized bed of tar sands wherein said fluidized bed of tar sands comprises a contiguous upper

cracking zone, an intermediate decoking zone, and a lower heat recovery zone,

(c) converting said tar sand containing bitumen in said upper cracking zone of said fluidized bed at effective temperatures, pressures, and velocities of said fluidized bed in a substantially reducing atmosphere into a coked sand and a vaporous off-gas, wherein said substantial reducing atmosphere comprises steam, combustion gases, and recycle gases, and said vaporous off-gas comprises said reducing atmosphere, hydrocarbonaceous material, and hydrogen,

(d) decoking said coked sand in said intermediate decoking zone of said fluidized bed with steam and oxygen in the presence of recycle gases, at effective temperatures, pressures and velocities, producing a hot spent sand, and said reducing atmosphere,

(e) disengaging said vaporous hot off-gas stream from said coked sand,

(f) preheating said tar sand containing bitumen in said step (a) by indirect heat exchange with said hot off-gas stream, and thereby at least partially cooling said off-gas stream,

(g) separating said at least partially cooled off-gas stream into streams comprising a raw oil stream and a recycle gas stream,

(b) passing at least a portion of said recycle gas stream into said heat recovery zone to contact said hot spent sand at effective velocities, thereby producing a cooled spent sand, and a heated recycle gas stream, and

(i) passing said heated recycle gas stream upwardly through said decoking zone and thence into said cracking zone as a portion of said reducing atmosphere therein.

4,094,768
SEPARATION OF BITUMEN FROM TAR SANDS USING SULFUR AND WATER

Everett J. Fuller, Gillette, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

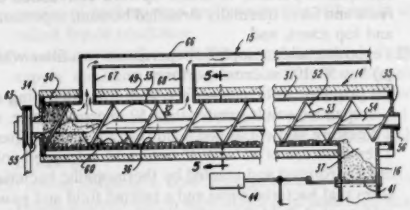
Filed Jan. 4, 1977, Ser. No. 756,643
Int. Cl.² C10G *1/04*
U.S. Cl. 208—11 LE **13 Claims**

1. A relativey low temperature process for separating bitumen from natural tar sand comprising mixing granular sulfur particles and water with said tar sand to form a sulfur-bitumen agglomerate phase, a sand phase and a water phase, separating said agglomerate from said sand and water and recovering bitumen from said agglomerate and wherein said sulfur-bitumen agglomerate is formed and separated from the water and sand at a temperature below about 170° F.

4,094,769
METHOD AND APPARATUS FOR RETORTING OIL SHALE

Harold Brown, Denver, Colo., assignor to Mineral Concentrates & Chemical Company, Inc., Winnemucca, Nev.

Filed Jun. 13, 1977, Ser. No. 805,983
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 R **27 Claims**



1. In apparatus for recovering oil products from oil shale and the like, the combination comprising:

means including a generally cylindrically shaped retort with a heat-conductive wall having a heated inner surface defining a retort chamber, said chamber having an inlet and an outlet and sloped downwardly for gravity flow from said inlet to said outlet and having a rotating member in said retort having a conveyor portion extending out from a rotary shaft arranged to force oil shale passed into said inlet in a direction countercurrent to gravity flow and having a peripheral surface area defining an annular flow passage between said heated inner surface and said peripheral surface area for crushing oil shale and confining the crushed oil shale to a layer to which heat is applied from said heated inner surface as the layer is moved from the inlet through an outlet to produce oil product vapors;

means for removing and condensing the oil product vapors into oil product liquids; and

means for selectively removing spent oil shale through said outlet.

4,094,770
PROCESS FOR REMOVING UNFILTERABLE SOLIDS FROM AN OIL

Phillip R. Bose, Pleasant Hill, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 22, 1977, Ser. No. 809,135
Int. Cl.² C10G *21/16*
U.S. Cl. 208—251 R **8 Claims**

1. A process for separating unfilterable, particulate solids from an oil, comprising:

(1) agglomerating said solids by admixing said oil with an agglomerating agent wherein the resulting mixtue contains for each volume of said oil an amount of said agent in the range of from about 0.05 to 3 volumes, said agent comprising a mixture of acetone and 2-butanone and containing, for each 100 volumes of acetone plus 2-butanone, at least 2 volumes of acetone and at least 2 volumes of 2-butanone, said admixing being at a temperature in the range of from about 20° to 160° C and at a pressure at least sufficient to maintain said agent in the resulting liquid-solid mixture;

(2) forming a solids-reduced oil containing said agent by separating said agglomerated solid from said resulting mixture;

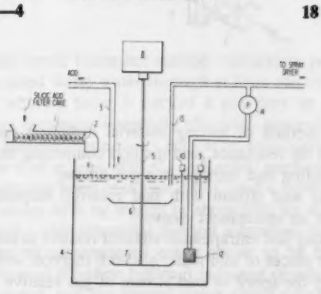
(3) separating said agent from said solids-reduced oil by vaporizing said agent; and

(4) using as at least a portion of said agent in step (1) at least a portion of said separated agent.

4,094,771
PROCESS FOR PREPARATION OF A SPRAYABLE PRECIPITATED SILICIC ACID SUSPENSION

Bernd Brandt, Wesseling-Berzdorf; Peter Nauroth, Wesseling; Albert Peters, Erftstadt-Liblar, and Helmut Reinhardt, Rodenkirchen, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Jan. 13, 1976, Ser. No. 648,848
Int. Cl.² B03B *1/00*
U.S. Cl. 209—4 **18 Claims**



1. Process for the production of a sprayable, highly concen-

trated, aqueous suspension of a precipitated silicic acid, said suspension having little grit and at least about 18 percent by weight solids, said process comprising:

(a) continuously feeding a silicic acid filter cake and a suspension agent into a dissolver container provided with stirring means;

(b) stirring said filter cake and suspension agent while maintaining a maximum pH value of about 4 in the suspension, said stirring means having a peripheral speed of about 20–30 m/sec; and

(c) continuously removing a portion of the resulting suspension from a zone of highest turbulence of the suspension in said container;

wherein said container and said stirring means each have a diameter and the ratio of container diameter to the diameter of the stirring means is about 3:1 and the ratio of container diameter to level of filling of said container is maintained at a maximum of about 1:2; and further wherein the silicic acid suspension in said container is maintained in an amount of at least 1.5 to about 2 kg. for each 1 kg of silicic acid filter cake which is added to the container.

4,094,772

METHOD OF AND APPARATUS FOR SORTING LIGHT REFUSE FRACTIONS

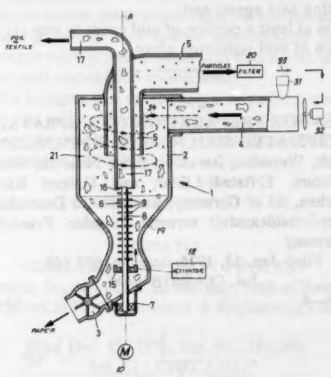
Klaus Hillekamp, Munich, and Hubert Kindler, Gröbenzell, both of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed May 19, 1977, Ser. No. 798,487

Claims priority, application Germany, May 22, 1976, 2623067

Int. Cl.² B07B 9/02; B07C 5/34

U.S. Cl. 209—12 **25 Claims**



1. A method of sorting material including flat pieces of different rip resistance, said method comprising the steps of:

suspending said material in a gas stream;

passing said stream with said material suspended therein over an entrapment element;

orienting said entrapement element relative to said stream so that pieces of said material catch thereon; and

setting the speed of said stream of gas relative to said element so that the less rip-resistant pieces tear free from said element and the more rip-resistant pieces remain caught on said element.

4,094,773

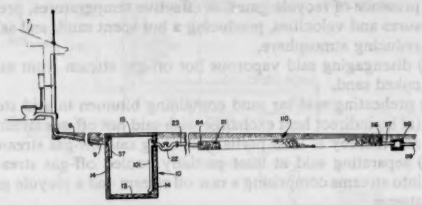
PROCESS FOR SEWAGE TREATMENT WITH COUNTERCURRENT HEAT TRANSFER MEANS

Stanley Beaumont, 118 Macorna St., Watsonia, Australia

Division of Ser. No. 667,171, Mar. 15, 1976, which is a continuation-in-part of Ser. No. 603,623, Aug. 11, 1975, abandoned, which is a continuation of Ser. No. 435,647, Jan. 23, 1974, abandoned. This application Jan. 24, 1977, Ser. No. 761,859

Int. Cl.² C02C 1/06

U.S. Cl. 210—5 **8 Claims**



1. A process for treating sewage, comprising

A. as a psychrophilic stage, flowing raw untreated sewage by gravity within a narrow and deep psychropilic compartment while:

(1.) heating the sewage along the bottom of said psychrophilic compartment to create upward convection currents and form thermally stratified bottom, supernatant, and top zones,

(2.) receiving transversely moving mesophilic sludge along said bottom from an adjoining narrow and deep mesophilic compartment, and

(3.) digesting said sewage at a temperature of about 20°–45° C. to form a psychrophilic sludge and a psychrophilic supernatant;

B. as a mesophilic stage, transferring said psychrophilic supernatant by displacement to said mesophilic compartment and flowing said psychrophilic supernatant therein while:

(1.) heating said supernatant along the bottom of the mesophilic compartment to create upward convection currents and form thermally stratified bottom, supernatant, and top zones, and

(2.) receiving transversely moving bacterial slime along the bottom of said mesophilic compartment from an adjoining narrow and deep entrapment portion of a thermophilic compartment; and

(3.) digesting said psychrophilic supernatant at a temperature of about 35°–55° C. to form a mesophilic supernatant and the mesophilic sludge;

C. as a thermophilic stage, transferring said mesophilic supernatant by displacement to said entrapment portion and flowing said supernatant therein while:

(1.) heating said supernatant along the bottom of said entrapment portion, to create upward convection currents and form thermally stratified bottom, supernatant, and top zones, and

(2.) exposing said mesophilic supernatant to a filter which:

(a) has 50–100 micron apertures, and

(b) provides sufficient surface area for entrapping any suspended solids greater than 50 microns in size, and

(3.) digesting said entrapped solids caught on said filter at a temperature of 45°–70° C until said entrapped solids are hydrolyzed and reacted by thermophilic bacteria to form said bacterial slime and a treated fluid and passing said treated fluid through said filter into an adjoining narrow and deep thermophilic treated portion along which said treated fluid flows while being heated along the bottom thereof;

D. as a sterilizing stage, transferring said treated fluid to the bottom zone of a sterilizing compartment having a bottom heat-transfer surface and a heating means;

E. heating said treated fluid from said bottom surface and with said heating means in said sterilizing compartment to a temperature above 75° C to form a sterilized treated fluid at the top of said sterilizing compartment; and

F. as a heat-exchange stage, transferring said sterilized treated fluid to an underlying storage compartment, having a top area and a sloping side area, from which heat is transferred at successively decreasing temperatures from the top area to said bottom surface of said sterilizing compartment and, from said sloping side area, to said bottoms of said treated and entrapment portions of said thermophilic compartment, said mesophilic compartment, and said psychrophilic compartment.

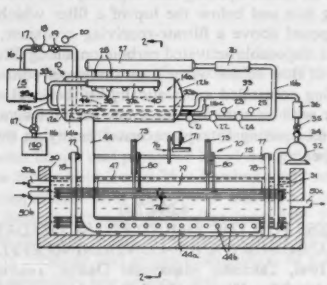
4,094,774
METHOD AND APPARATUS FOR OXYGENATING AEROBICALLY DECOMPOSABLE LIQUORS

Eugene J. Smith, Storms Rd., Valley Cottage, N.Y. 10989

Continuation-in-part of Ser. No. 476,856, Jun. 6, 1974, abandoned, and a continuation-in-part of Ser. No. 530,037, Dec. 5, 1974, abandoned. This application Mar. 10, 1975, Ser. No. 556,918

Int. Cl.² C02B *1/34;* C02C *1/02*

U.S. Cl. 210—12 31 Claims



1. A raw and treated sewage and wastewater effluent oxygenating apparatus comprising, in combination:

(1) means defining a source of liquefied high purity oxygen constituting a cryogen;

(2) a closed receiver tank defining an oxygenating chamber having a gas head section to which is communicated conduit means extending from said source for supplying gaseous phase oxygen to said head section, with said means including a flow conduit section of heat conducting material acting with the oxygen flowing through the latter as a heat sink;

(3) supply means defining a substantially constant volume source of such sewage and wastewater effluent in raw or mixed liquor condition;

(4) means to transfer such liquor under pressure from said supply means to said gas head section for oxygenating contact therein with the gaseous phase oxygen, to pool the oxygenated liquor in said receiver tank below said head section and to deliver from said receiver the oxygenated liquor; and

(5) means defining a flow passage section of said transfer means through which such liquor is to flow with this flow passage section being associated in indirect heat exchange relation to said oxygen supply conduit section and liquor oxygen flowing in the latter for conversion to gaseous phase oxygen and for delivery of the latter to said receiver gas head section at elevated pressure and delivery of the liquor in cooled condition to said gas head section.

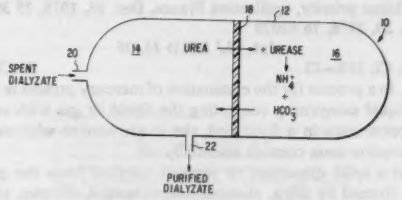
4,094,775
DIALYSIS SYSTEM

William A. Mueller, Glendale, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Feb. 28, 1977, Ser. No. 772,434

Int. Cl.² B01D *13/00*

U.S. Cl. 210—22 19 Claims



1. A system for selectively removing urea from an aqueous liquid containing urea and positive metal cations comprising in combination:

a container divided into a first chamber and a second chamber by means of a continuous sheet of cationically charged polymeric membrane selectively permeable to urea and having low permeability to cations;

said first chamber including means for receiving said liquid; and

said second chamber receiving a solution containing a urea decomposition agent whereby said cations are repelled by said membrane and retained in said liquid and urea permeates through the membrane into the solution and is decomposed into bicarbonate and ammonium, the ammonium being retained in the solution in the second chamber.

4,094,776
METHOD FOR TREATMENT OF OIL-CONTAINING WASTE WATER BY USING AN OIL ADSORBENT

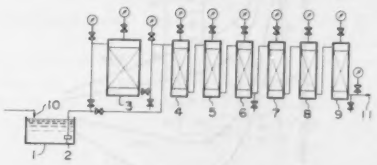
Kosaku Noguchi, Tokyo; Kiyoharu Yoshimura, Izumi; Honami Tanaka, Izumi, and Masao Hayashi, Izumi, all of Japan, assignors to Kou Oil Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1976, Ser. No. 708,716

Claims priority, application Japan, Oct. 6, 1975, 50-119824; Nov. 27, 1975, 50-141180

Int. Cl.² C02B *9/02*

U.S. Cl. 210—27 6 Claims



3. A waste water treatment method comprising passing an oil-contaminated waste water through at least one oil-adsorbing vessel wherein there is packed a powdery or granular oil-adsorbent consisting essentially of a solid, particulate pitch formed by heat-treating a heavy petroleum hydrocarbon oil at a temperature of at least 400° C., said solid, particulate pitch having a softening point of at least 200° C. and a volatile matter content of about 30% by weight to about 50% by weight.

6. A waste water treatment method according to claim 3 wherein the oil-contaminated waste water to be treated is subjected to sand filtration before it is passed through the oil adsorbing vessel, and the treated water coming from the oil adsorbing vessel is further treated with active carbon by passing it through at least one active carbon-packed column.

4,094,777

PROCESS FOR REMOVING MERCURY FROM A GAS OR A LIQUID BY ABSORPTION ON A COPPER SULFIDE CONTAINING SOLID MASS

André Sugier, Rueil Malmaison, and Florentino la Villa, Nanterre, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 16, 1976, Ser. No. 751,452

Claims priority, application France, Dec. 18, 1975, 75 39215; Jan. 23, 1976, 76 02079

Int. Cl.[2] B01D *15/06*

U.S. Cl. 210—32 21 Claims

1. In a process for the elimination of mercury present in a gas or liquid comprising contacting the liquid or gas with an absorption mass in a fixed bed, the improvement wherein the absorption mass consists essentially of:

(a) a solid dispersant or support selected from the group formed by silica, alumina, silica-alumina, silicates, aluminates and silico-aluminates,

(b) copper whereof at least 30% is in the sulphide state and wherein the copper sulphide proportion in the absorption mass, calculated as copper, represents 2 to 65% of the weight of the mass, and

(c) 0–5% of silver in the sulfide state.

4,094,778

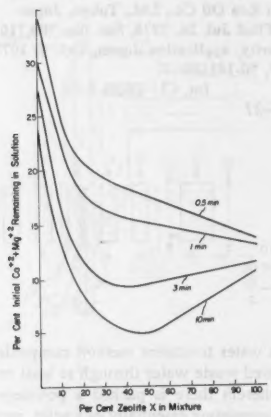
SEQUESTERING OF Ca^{++} AND MG^{++} IN AQUEOUS MEDIA USING ZEOLITE MIXTURES

Arthur Francis Denny, Katonah, N.Y.; Anthony Joseph Gioffre, Ridgefield, Conn., and John Delano Sherman, Chappaqua, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,481

Int. Cl.[2] C02B *1/44, 5/02*

U.S. Cl. 210—38 A 3 Claims



1. Process for sequestering calcium and magnesium cations from aqueous solutions thereof which comprises contacting at a temperature of from 40° to 200° F. said aqueous solution having a pH of from 7 to 10 and containing from 0.0005 to 0.005 gram ions of calcium per liter and from 0.000125 to 0.005 gram ions of magnesium per liter with a mixture of sodium zeolite A and sodium zeolite X, said mixture containing from 40 to 70 weight percent of one of the said zeolite species and a complementary amount of the other.

4,094,779

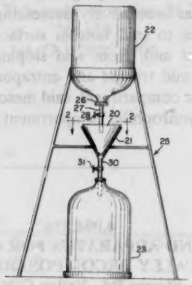
WATER PURIFICATION MEANS AND METHOD

Abraham S. Behrman, 240 E. Delaware Pl., Chicago, Ill. 60611

Filed Dec. 27, 1976, Ser. No. 754,636

Int. Cl.[2] C02B *1/14;* B01D *23/14*

U.S. Cl. 210—40 3 Claims



1. A process for removing objectionable tastes and odors from a relatively small volume of water at an automatically controlled rate of flow which comprises allowing the water to flow by gravity from an inverted upper container closed except for an outlet opening and superimposed above and discharging into and below the top of a filter which in turn is superimposed above a filtrate-receiving container, said filter holding a disposable activated carboncontaining filter medium, the rate of flow of the water from the upper container to the filter being controlled automatically by the level of water in the filter with air entering said container exclusively through said outlet opening to replace water emptying through said outlet opening.

4,094,780

PROCESS FOR THE LIQUID PHASE OXIDATION OF ORGANIC SUBSTANCE-CONTAINING EFFLUENTS

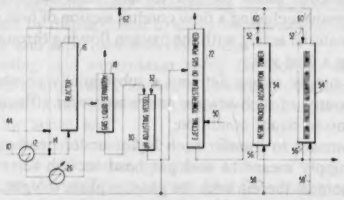
Yasuto Iwai, Takaishi; Masayoshi Okabe, Tokyo; Naotoshi Seki; Atsuhiko Hiai, both of Takaishi, and Seiya Iguchi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,845

Claims priority, application Japan, Aug. 14, 1975, 50-98077; Aug. 14, 1975, 50-98078; Aug. 14, 1975, 50-98079; Aug. 14, 1975, 50-98080

Int. Cl.[2] C02B *1/34, 1/42*

U.S. Cl. 210—38 B 4 Claims



1. A process for the liquid phase oxidation of an organic substance-containing effluent comprising oxidizing said effluent at a pH range of 6.0 to 10.0 and at a temperature of 150° to 300° C and under a pressure of 10 to 100 kg/cm^2 in the presence of an oxidation catalyst system composed of a copper catalyst having a copper ion concentration of 50 to 5000 ppm and an ammonium ion concentration of at least five times that of the copper ion and then recovering said copper catalyst from the treated effluent by double-decomposing the ammonium salt contained in said treated effluent with strong alkali, separating

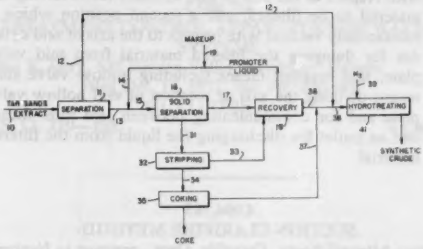
more than 70 weight percent of the dissolved gases from the decomposition solution by ejection with air or steam, adjusting the pH of the ejected decomposition solution to a level of 4.0 to 9.0 whereby dissolved copper catalyst therein is precipitated, and separating the thus precipitated copper catalyst from the solution.

4,094,781

SEPARATION OF SOLIDS FROM TAR SANDS EXTRACT

George J. Snell, Fords, and Raymond H. Long, Morristown, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Nov. 10, 1976, Ser. No. 740,616
Int. Cl.[2] C10G *1/04*; B01D *21/00*
U.S. Cl. 210—54 **11 Claims**



1. A process for separating finely divided sand from a tar sands extract, comprising:

separating said finely divided sand from said tar sands extract by gravity difference separation in the presence of a promoter liquid, said promoter liquid having a characterization factor of at least 9.75, a 5 volume percent distillation temperature of at least 250° F and a 95 volume percent distillation temperature of at least 350° F and no greater than 750° F and being present in an amount sufficient to promote and enhance separation of a tar sands liquid essentially free of sand; and

recovering tar sands liquid essentially free of sand.

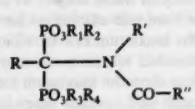
4,094,782

N-ACYL-1-AMINO ALKANE-1,1-DIPHOSPHONIC ACID COMPOUNDS AND COMPOSITIONS FOR AND METHOD OF USING SAME

Friedrich Krüeger, Edingen, and Walter Michel, Ilvesheim, both of Germany, assignors to Joh. A. Benckiser, Ludwigshafen am Rhein, Germany

Division of Ser. No. 677,286, Apr. 15, 1976, Pat. No. 4,029,697. This application Jan. 18, 1977, Ser. No. 760,368
Claims priority, application Germany, Apr. 30, 1975, 2519264; Jul. 5, 1975, 2530139
Int. Cl.[2] C02B *5/06*
U.S. Cl. 210—58 **6 Claims**

1. In a process of preventing scale and deposit formation in aqueous systems, the step which comprises adding to the aqueous system, as scale and deposit formation suppressing agent, an N-acyl-1-amino alkane-1,1-diphosphonic acid of the formula

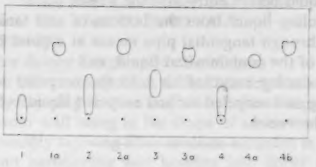


in which

R, R', and R" are hydrogen or lower alkyl and

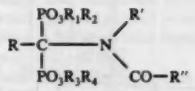
R_1, R_2, R_3, and R_4 are hydrogen or an alkali metal,

in substoichiometrical amounts calculated for the amount of hardness-causing compounds present in the aqueous system.



1 Amino methane diphosphonic acid
1a N-Propanyl amino methane diphosphonic acid (example 1)
2 1-Amino propane-1,1-diphosphonic acid
2a N-Acetyl-1-amino propane-1,1-diphosphonic acid (example 4)
3 N-Methylamino methane diphosphonic acid
3a N-Acetyl-N-methylamino methane diphosphonic acid (example 3)
4 1-Amino ethane-1,1-diphosphonic acid
4a N-Acetyl-1-amino ethane-1,1-diphosphonic acid (example 6)
4b N-Propanyl-1-amino ethane-1,1-diphosphonic acid (example 2)

4. A composition for suppressing scale and deposit formation in aqueous systems, said composition containing, as scale and deposit formation suppressing agent, an N-acyl-1-amino alkane-1,1-diphosphonic acid of the formula



in which

R, R', R" are hydrogen or lower alkyl and

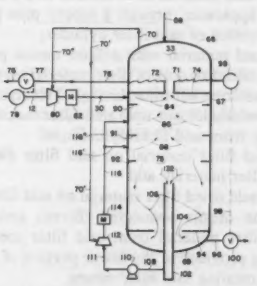
R_1, R_2, R_3, and R_4 are hydrogen or an alkali metal.

4,094,783

CENTRIFUGAL FLOTATION SEPARATOR

George F. Jackson, 5745 E. 47 Pl., Tulsa, Okla. 74135

Filed Sep. 29, 1977, Ser. No. 837,833
Int. Cl.[2] C02B *1/34*
U.S. Cl. 210—63 R **10 Claims**



10. In a multi-stage recycling centrifugal flotation separator system comprising a circular cylindrical closed vessel with vertical axis having a horizontal tray positioned inside the vessel near the top thereof, said tray having an axial tubular opening, the method of operating said separator comprising the steps of;

(a) introducing air under pressure into said vessel at the top thereof;

(b) introducing contaminated liquid into said vessel through a tangential inlet pipe near the top of said vessel but under said tray;

(c) drawing off contaminated froth from an outlet positioned above said tray;

(d) drawing off air to be recycled from the space above said tray, through a pipe near the top of said vessel;

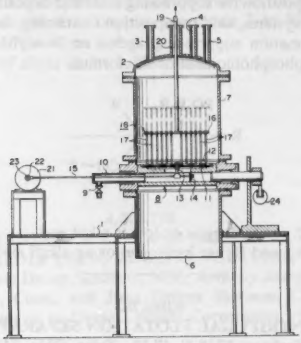
(e) drawing off clean liquid from the bottom of said vessel;
(f) introducing said air to be recycled into an eductor into the inlet contaminated liquid, and mixing the recycled air and liquid before entry into the vessel;
(g) recycling liquid from the bottom of said tank into the tank through tangential pipe means at a point below the entry of the contaminated liquid; and
(h) introducing recycled air into the recycled liquid and mixing said recycled air and recycled liquid before entry into the vessel.

4,094,784

APPARATUS AND METHOD FOR FILTERING DEHYDRATING AND DRYING MATERIAL

Itsuro Hirano, Tokyo, Japan, assignor to B F Kogyo Kaisha, Ltd. (Bi Efy Kogyo Kabushiki Kaisha), Tokyo, Japan

Filed Jul. 27, 1976, Ser. No. 709,018
Claims priority, application Japan, Dec. 30, 1975, 50-158696
Int. Cl.[2] B01D *37/00, 35/20*
U.S. Cl. 210—68 **29 Claims**



1. A method for filtering, dehydrating and drying material comprising steps of
supplying said material to be treated into a filter cylinder of a filter apparatus through a supply pipe provided at the upper portion of said filter cylinder;
filtering said material with a filter means provided in said filter cylinder to collect filter material on said filter means and to remove a filtrate through a rotatable hollow valve stem communicating with said filter means and extending laterally from said filter cylinder;
drying said filter material on said filter means to prepare dried filter material; and
vibrating said dried filter material on said filter means with a vibration means connected thereto and dropping said dried filter material from said filter means through an opening provided at the lower portion of said filter cylinder by rotating said filter means;
wherein said filter cylinder has a hollow valve plate mounted rotatably at the center portion thereof by means of said hollow valve stem connected thereto so that material to be treated is deposited on said valve plate when it is in the horizontal position and treated material is dumped from said valve plate when it is rotated from the horizontal position to the vertical position, and
said filter means is provided on said hollow valve plate and communicates with said hollow valve stem through said valve plate.

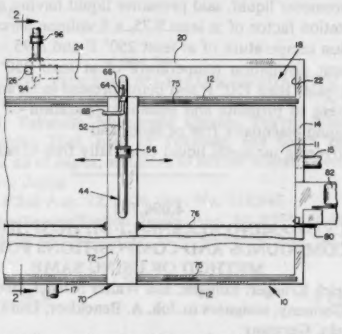
11. An apparatus for filtering, dehydrating and drying a material, comprising:
a vertically extending filter cylinder formed with a top cover formed with input means for supplying a material to be filtered, said cylinder having a full opening on the lower side thereof;
a base for mounting said cylinder;
a hollow valve plate positioned in said cylinder;
filter means for filtering the material to be filtered supported on said hollow valve plate;
auxiliary filter means positioned in said cylinder above said filter means, said auxiliary filter means comprising a mounting plate adapted to permit the passage of material to be filtered therepast and formed with a plurality of rods suspended from the lower surface thereof and an actuator extending upwardly from the upper surface thereof through an opening provided in the top cover of said cylinder, whereby said auxiliary filter means may be moved upwardly and downwardly by moving said actuator to permit the lower end of said rods to engage with said filter means; and
means for rotating said hollow valve plate and filter means between a first position which is substantially horizontal with respect to the acis of said cylinder for receiving the material to be filtered, and a second position which is substantially vertical with respect to the axis of said cylinder for dumping the filtered material from said valve plate, said rotating means including hollow valve stem means defining the axis of rotation of said hollow valve plate and for communicating between said filter means and an outlet for discharging the liquid from the filtered material.

4,094,785

SUCTION CLARIFIER METHOD

William Michael Booty, Corvallis, Oreg., assignor to Neptume Microfloc, Inc., Corvallis, Oreg.

Filed Oct. 26, 1976, Ser. No. 735,381
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—70 **1 Claim**



1. A method for unclogging inlets of a siphon conduit used for discharging sludge from the bottom of a liquid clarification settling tank into an adjoining chamber and for maintaining a substantially constant flow of liquid through a siphon conduit having inlets subject to clogging comprising:
causing a stream of liquid waste to flow into and a stream of clarified liquid to flow out of a settling tank at rates set to maintain the surface of liquid in said settling tank substantially at a predetermined level;
producing a flow of sludge by siphon action from the bottom of said tank into an adjoining chamber through a conduit having a plurality of inlets subject to clogging;
removing sludge from said adjoining chamber at a fixed rate greater than the maximum rate of which sludge can flow through said conduit when one or more of said inlets are clogged and less than the maximum rate at which sludge can flow through said conduit when all of said inlets are unclogged so that when one or more of said inlets are clogged, the level of liquid in said adjoining chamber at least momentarily drops to a level below the level at which liquid is maintained when all inlets are unclogged

and the vertical distance between the levels of the liquids in the two chambers increases to an amount greater than the amount maintained when all said inlets are unclogged thereby creating a greater amount of suction inside said conduit then is present when all said inlets are unclogged thus to urge the clogging material through the clogged inlet and into said conduit; and

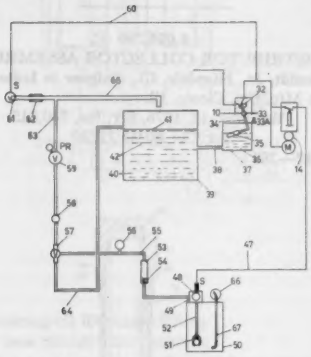
maintaining said fixed rate of sludge removal from said adjoining chamber indefinitely until such time as all liquid is removed therefrom.

4,094,786

TREATMENT CONTROL APPARATUS FOR WATER SYSTEMS

John R. Bury, 620 Hidden Valley, Kitchener, Canada

Filed Oct. 11, 1977, Ser. No. 840,981
Int. Cl.[2] C02B *1/18*
U.S. Cl. 210—101 **4 Claims**



1. A system for introducing an accurate quantity of treating solution into a water reservoir to which make up water is added responsive to a predetermined drop in head, said water being added through a control orifice at a predetermined pressure at a constant rate of flow, and comprising in combination: a tank in liquid communication with said reservoir the liquid level in said tank corresponding to the liquid level in said reservoir; a normally open liquid level responsive first electrical switch closable upon a drop in liquid level in said tank corresponding to a predetermined drop in head in said reservoir; means for pumping make-up water at a predetermined rate of flow to said reservoir responsive to closure of said switch; a totalizer device including a clock type motor electrically actuated responsive to closure of said switch; totalizer mechanism associated with said motor and driven thereby, said mechanism defining totalizing cycles responsive to a predetermined time base determined by said motor and responsive to the volume of make-up water delivered to said reservoir through said control orifice; a second normally open electrical switch associated with said totalizing mechanism actuably closable thereby over a predetermined portion only of a cycle thereof; a treating solution container and a second electrically actuated pump of constant pressure characteristic for delivering treating solution from said container to said reservoir; a second control orifice for said treating solution between said second pump and said reservoir; means for actuating said second pump responsive to closure of said second switch; and means for maintaining such float switch closed until the water level in said reservoir rises to a predetermined level.

4,094,787

FILTER FOR PAINT OR OTHER LIQUIDS

Costanzo Giordano, 12820 S. Laflin, Chicago, Ill. 60643

Filed Dec. 6, 1976, Ser. No. 747,787
Int. Cl.[2] B01D *33/38*
U.S. Cl. 210—103 **14 Claims**

1. A filter device for paint or other liquid,

said filter device comprising a filter housing having a downwardly tapering bottom wall and a closed top wall,

said bottom wall being in the shape of an inverted cone,

a downwardly tapering filter medium mounted in said housing and partitioning said housing into upper and lower compartments,

said filter medium being in the shape of an inverted cone,

said upper compartment being disposed between said top wall and said filter medium,

said lower compartment being disposed between said filter medium and said bottom wall,

said housing having a lower opening communicating with said lower compartment at the lower end of said bottom wall and having appurtenant liquid inlet and drain means for connection to said lower opening,

an outlet pipe extending from said upper compartment and through said top wall,

a control valve connected to said lower opening and to said liquid inlet means and said drain means and selectively operable between first and second positions for switching said lower opening between said liquid inlet means and said drain means, respectively,

selectively operable liquid supply means for supplying the liquid under pressure to said liquid inlet means to cause the liquid to pass through said control valve and said filter medium into said upper compartment and out of said upper compartment through said outlet pipe to filter the liquid,

spray means in said upper compartment and directed toward said filter medium,

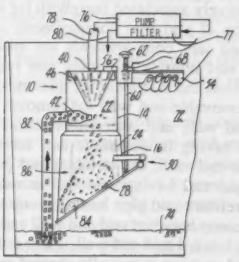
and selectively operable solvent supply means connected to said spray means for causing the solvent to be sprayed upon said filter medium and to pass through said filter medium into said lower compartment and through said control valve to said drain means to backwash said filter medium.

4,094,788

AQUARIUM GRAVEL CLEANER

Denzel J. Dockery, 3317 E. Bristol Rd., Flint, Mich. 48507

Filed Jul. 1, 1976, Ser. No. 701,883
Int. Cl.[2] E04H *3/20*
U.S. Cl. 210—169 **19 Claims**



1. For use with an aquarium carrying aggregate along its bottom, a device comprising,

a housing having an interior chamber,

means for drawing said aggregate into said housing chamber, and drawing means further comprising a pump having an intake line, fluid passage means open at one end to said housing chamber and adapted to engage the aggregate at its other end, said intake line being coupled to said

housing chamber to thereby draw a water and aggregate mixture through said fluid passage means and into said housing chamber,

means for washing said aggregate in said housing chamber, said washing means further comprising a tubular and conically shaped sieve mounted in said housing chamber, said seive having its interior open to the intake line and its exterior open to the fluid passage to the intake line and its exterior open to the fluid passage means,

means for returning the washed aggregate to said aquarium, and

wherein said fluid passage means projects the water and aggregate mixture tangentially into said housing chamber whereby said fluid stream circulates in a vortex around said sieve.

4,094,789

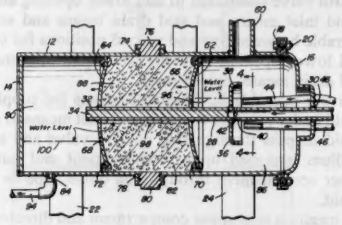
SULFUR GAS REMOVING AND SOLID PARTICLE FILTER FOR WELL WATER

Ronald J. Kemper, R.R. #7, Defiance, Ohio 43512

Filed Mar. 17, 1977, Ser. No. 778,783

Int. Cl.[2] B01D *19/00, 27/00*

U.S. Cl. 210—188 **7 Claims**



1. A combined sulfur gas removing and solid particle filtering assembly for well water, said assembly including a hollow housing having interior baffle plates dividing the interior of said housing into first, second and third compartments, means operative to discharge water from said third compartment, each of said baffle plates defining spaced water flow openings therethrough for the flow of water from the first compartment through the second compartment and into the third compartment, water filtering material disposed in said second compartment for filtering water flowing therethrough, and water and air inlet means for said first compartment operative to admit jets of water and jets of air under pressure into the first compartment in a manner to thoroughly commingle said jets of water and air, said first compartment also including air vent means operatively associated therewith for venting air from an upper portion of said first compartment, said housing being elongated and said compartments are spaced longitudinally therealong, said housing including one removable end wall, said baffle plates and water and air inlet means being supported from said removable end wall for removal from said housing with said end wall, said water inlet means including a water supply pipe having its discharge end extending and secured through said end wall, the terminal end portion of said pipe being plugged and having said baffles mounted thereon for support therefrom, said pipe having a cup-shaped splash plate mounted thereon between said end wall and the adjacent baffle and opening toward said end wall, water outlet ports formed in said pipe and opening outwardly thereof into said cup-shaped splash plate, said air inlet means including a plurality of compressed air pipe discharge end portions spaced about said water pipe and opening toward and into said splash plate from the side of said water outlet ports remote from the closed end of said splash plate.

5. A combined sulfur gas removing and solid particle filtering assembly for well water, said assembly including a hollow housing having interior baffle plates dividing the interior of said housing into first, second and third compartments, means operative to discharge water from said third compartment, each of said baffle plates defining spaced water flow openings therethrough for the flow of water from the first compartment through the second compartment and into the third compartment, water filtering material disposed in said second compartment for filtering water flowing therethrough, and water and air inlet means for said first compartment operative to admit jets of water and jets of air under pressure into the first compartment in a manner to thoroughly commingle said jets of water and air, said first compartment also including air vent means operatively associated therewith for venting air from an upper portion of said first compartment, said water inlet means including a water supply pipe having a discharge end portion opening through said housing and into said first compartment, the terminal end of said discharge end portion being plugged, said discharge end portion having a cup-shaped splash plate mounted thereon between said terminal end and the portion of said housing through which said discharge end portion opens, said splash plate opening toward said housing portion, said pipe having water outlet ports formed therein and opening outwardly thereof into said cup-shaped splash plate, said air inlet means including a plurality of compressed air pipe discharge end portions spaced about said water pipe and opening toward and into the open side of said cup-shaped splash plate.

4,094,790

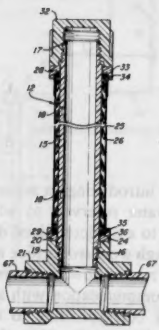
DISTRIBUTOR COLLECTOR ASSEMBLY

Henry Schmidt, Jr., Hinsdale, Ill., assignor to Industrial Filter & Pump Mfg. Co., Cicero, Ill.

Filed Nov. 11, 1976, Ser. No. 740,815

Int. Cl.[2] B01D *23/20*

U.S. Cl. 210—289 **9 Claims**



1. In combination

a rigid conduit provided with a plurality of apertures in the wall thereof and having an end portion,

an axially rigid tubular grid fitted over said conduit, said end portion of said conduit extending beyond one end of said grid,

an annular, resilient sealing gasket positioned over said tube and said conduit adjacent to and beyond said one end of said grid, one end portion of said tube being folded back on the external side of itself over said gasket, and

internally screw threaded closure means secured to said end of said conduit for sealing said end of said conduit,

said closure means having an annular skirt portion extending over said gasket and overlying portions of said tube for compressing said gasket and overlying portions of said tube into sealing relationship with said conduit.

5. In combination,

a plurality of lengths of plastic tubing,

a plurality of plastic connectors sealably connected between respective lengths of said tubing, and

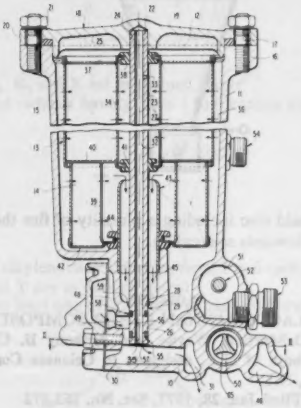
a plurality of the combinations of claim 1 wherein each said conduit is sealably connected to one of said connectors.

4,094,791

LUBRICATING OIL FILTER WITH AN UPRIGHT FILTER POT

Ulrich Conrad, Ludwigsburg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 23, 1976, Ser. No. 744,309
Claims priority, application Germany, Nov. 27, 1975, 2553293
Int. Cl.[2] B01D *27/08*
U.S. Cl. 210—316 13 Claims



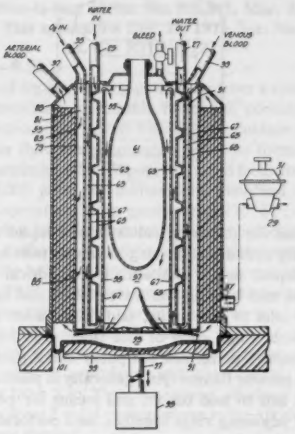
1. A lubricating-oil filter comprising:
a. a filter base having a bore therein;
b. a filter pot arranged generally upright at the filter base, said filter pot having a large inner space;
c. a bolt retained at its lower end in the bore in the filter base and arranged centrally in the inner space of the filter pot;
d. a first upper clean oil filter chamber centered around the bolt in the inner space of the filter pot;
e. a second lower clean oil filter chamber centered around the bolt in the inner space of the filter pot;
f. a first base channel means in the filter base for receiving oil emptied by way of the bore from the inner space of the filter pot from the first clean oil filter chamber, and from the second clean oil filter chamber;
g. an intermediate channel means in the bolt for connecting the first clean oil filter chamber with the first base channel means;
h. a first oil discharge channel means in the filter base for connecting the second clean oil filter chamber by way of the bore in the filter base with the first base channel means;
i. a second base channel means for receiving oil emptied from the second clean oil filter chamber by way of the first oil discharge channel;
j. a second oil discharge channel means in the filter base for connecting the inner space of the filter pot by way of the bore in the filter base with the first base channel means;
whereby, upon removal of the lower end of the bolt from the bore in the filter base, oil is emptied from the inner space of the filter pot through the first and second oil discharge channels by way of the bore in the filter base into the first base channel means.

4,094,792

MEMBRANE FLUID TRANSFER METHOD AND APPARATUS

Donald J. Bentley, Newport Beach, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Filed Sep. 8, 1976, Ser. No. 721,458
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—321 B 21 Claims



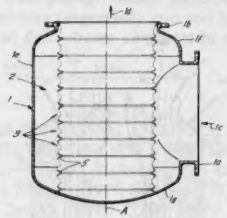
1. A membrane fluid transfer device comprising:
a housing having a process fluid inlet and outlet;
an atrium chamber means for providing a reservoir for incoming fluid formed within said housing and in communication with said housing process fluid inlet;
a spirally wound, flattened, tubular permeable membrane having a transfer fluid inlet at one end of said tubular membrane and a transfer fluid outlet at the opposite end of said membrane, said membrane forming passageways between adjacent windings of said membrane, one end of said passageways being in communication with said ventricle and the opposite end of said passageways being in communication with said housing process fluid outlet;
control means for maintaining a substantially constant transfer fluid flow in communication with said transfer fluid inlet;
control means for maintaining a substantially constant transfer fluid pressure in communication with said transfer fluid outlet; and a ventricle means for pumping fluid to be treated through said passageways between said adjacent windings of said membrane, said ventricle means being connected to said atrium by a fluid passageway having a valving means positioned within said fluid passageway, said membrane windings and a portion of said ventricle being formed by a member adapted to be actuated by a driving means, whereby the pressure of the fluid to be treated is pumped alternately from a pressure lower than the controlled and constant transfer fluid pressure to a pressure higher than the controlled transfer fluid pressure and thus allowing for alternately opening and closing of said passageways between said adjacent windings of said membrane.

4,094,793

FILTER APPARATUS, ESPECIALLY FOR A LIQUID TO BE FED TO A POWER-PLANT CONDENSER

Dieter Patzig, Ratingen-Tiefenbroich, Germany, assignor to Ludwig Taprogge Reinigungsanlagen fur Rohren-Warmeaustauscher, Dusseldorf, Germany

Filed Mar. 7, 1977, Ser. No. 775,400
Claims priority, application Germany, Mar. 6, 1976, 2609332
Int. Cl.[2] B01D *25/02, 29/24*
U.S. Cl. 210—323 R 9 Claims



1. A filter for removing solids from a liquid comprising a substantially cylindrical housing having an inlet and and outlet for said liquid, and a substantially cylindrical filter basket disposed in said housing and traversed by said liquid, passing from said inlet to said outlet, said filter basket comprising a stack of filter rings, each of said filter rings having an outwardly concave perforated periphery and a pair of inwardly extending annular flanges lying generally in planes perpendicular to the axis of said basket, and means for connecting the flanges of adjoining rings together, said perforated periphery being constituted as a stamped sheet metal body of rotation centered on the axis of the respective ring and having in axial section a rounded convex configuration reaching inwardly, said flanges being connected to said body of each ring on opposite sides thereof whereby each of said filter rings is fully self-supporting.

4,094,794

HYDROCYCLONE

Albrecht Kahmann, Weingarten, Germany, assignor to Escher Wyss GmbH, Ravensberg, Germany

Continuation of Ser. No. 567,823, Apr. 14, 1975, abandoned.
This application Mar. 8, 1977, Ser. No. 775,624
Claims priority, application Switzerland, Apr. 16, 1974, 5224/74
Int. Cl.[2] B01D *21/26;* B04C *3/06*
U.S. Cl. 210—512 R 3 Claims

1. A hydrocyclone for separating impurities from a fiber suspension comprising

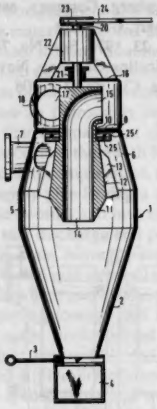
a housing defining a separation chamber and having an aperture at an upper end,

an inlet duct connected tangentially to an upper part of said housing below said aperture for introducing a fiber suspension directly into said separation chamber,

a hollow rotor rotatably mounted in said housing, said rotor defining an outlet duct extending from below said inlet duct along a longitudinal axis from said separation chamber through said aperture with a clearance to an upper portion outside said separation chamber, said upper portion extending in an outward direction angularly of said longitudinal axis and terminating at an orifice,

a casing surrounding said orifice of said rotor and having a tangential outlet aperture therein for exhausting of a purified suspension, and

a centrifugal disc mounted on said rotor within said housing above said inlet, said disc being disposed below and in facing relation to said casing and said aperture of said housing upper part for preventing passage of heavy particles from said housing through said aperture into said



casing, said disc including a plurality of fins thereon extending towards said casing.

4,094,795

POLYGALACTOMANNAN ETHER COMPOSITIONS

Ronald N. DeMartino, Wayne, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Jan. 28, 1977, Ser. No. 763,372
Int. Cl.[2] E21B *43/25*
U.S. Cl. 252—8.55 R 6 Claims

1. A hydraulic well-treating fluid composition which comprises an aqueous solution containing N,N-dialkylacrylamide ether adduct of polygalactomannan gum as a gelling agent in an amount in the range between about 0.05 and 5 weight percent based on the weight of the water component, wherein each alkyl group contains between one and about four carbon atoms; and a breaker additive for reduction of solution viscosity.

4,094,796

PROCESS FOR PREPARING NOVEL COMPOUNDS FOR USE AS FABRIC SOFTENERS IN WATER SOLUTIONS THEREOF

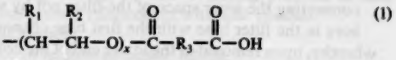
Eckhard C. A. Schwarz, 115 N. Park Ave., Neenah, Wis. 54956, assignor to Biax-Fiberfilm Corporation, Neenah, Wis.

Filed Jun. 7, 1977, Ser. No. 804,232
Int. Cl.[2] D06M *13/34*
U.S. Cl. 252—8.8 11 Claims

1. A composition of matter having the following structural formula:

(a)

wherein X, Y, and Z each being selected from the group consisting of



(I)

wherein one of R_1 and R_2 is hydrogen and the other is an alkyl group having from 1 to 6 carbon atoms with the alkyl to hydrogen mole ratio being less than 0.4 and X being an integer of

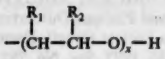
at least 1 and R_3 is a diradical selected for the group consisting of

R_3 is a diradical of either:

(a) 1 to 6 methylene groups

(b) a diradical of: —CH=CH—

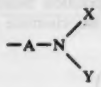
(c) a diradical of:



(2)

where R_1, R_2 and X are as defined above

alkyl radicals having from 1 to 6 carbon atoms (3)



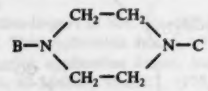
(4)

wherein

A is an alkylene radical having from 1 to 6 carbon atoms and

X and Y are as defined above

wherein at least one of X, Y and Z has structural formula (1) and



(b)

wherein B & C are each selected for the group consisting of radicals having above structural formula (1), above structural formula (2) and alkyl group having from 1 to 6 carbon atoms with at least one of B & C having structural formula (1).

4,094,797

OXIDATION STABLE FIBER LUBRICANT

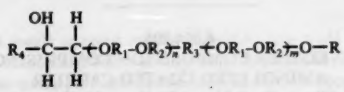
David Dudley Newkirk; Robert Bernard Login, both of Woodhaven, and Basil Thir, Wyandotte, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Aug. 1, 1977, Ser. No. 820,405

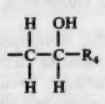
Int. Cl. D06m *13/10*

U.S. Cl. 252—8.9 **22 Claims**

1. A lubricant for thermoplastic fibers comprising a block or heteric copolymer polyoxyalkylene composition having the formula:



wherein $n + m$ has a value to produce a molecular weight of about 300 to about 3000; R is selected from the group consisting of hydrogen, the residue of an aliphatic monocarboxylic acid, having 1 to about 24 carbon atoms



and mixtures thereof; R_1 and R_2 are the same or different and derived from lower alkylene oxides selected from the group consisting of ethylene oxide, 1,2-propylene oxide and butylene oxide; R_3 is a divalent radical derived from a difunctional aromatic compound containing at least two active hydrogens and R_4 is an alkyl radical having about 1 to about 22 carbon atoms.

4,094,798

OIL RECOVERY PROCESS USABLE IN HIGH TEMPERATURE FORMATIONS CONTAINING HIGH SALINITY WATER WHICH MAY INCLUDE HIGH CONCENTRATIONS OF POLYVALENT IONS

Jack F. Tate, and Jim Maddox, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 554,891, Mar. 3, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,788

Int. Cl.[2] E21B *43/22*

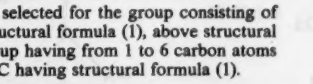
U.S. Cl. 252—8.55 D **12 Claims**

1. A method for recovering petroleum from a subterranean, petroleum-containing, permeable formation penetrated by at least one injection well and at least one production well, both wells being in fluid communication with the formation, said formation containing water whose salinity is from about 50,000 to about 225,000 parts per million total dissolved solids, the formation temperature being greater than 175° F, comprising:

a. introducing into the formation via the injection well an aqueous surfactant-containing fluid to displace petroleum toward the production well, said fluid comprising

(1) from .05 to 5.0 percent by weight of an anionic organic sulfonate surfactant having an average equivalent weight not to exceed 360 selected from the group consisting of water-soluble sodium, potassium or ammonium salts of petroleum sulfonates, alkyl sulfonates having from 5 to 20 carbon atoms, alkylaryl sulfonates having from 5 to 14 carbon atoms in the alkyl chain and mixtures thereof;

(2) from .05 to about 5.0 percent by weight of a phosphate ester surfactant with an average molecular weight not to exceed about 1,000 having the following formula:



wherein R is an alkyl or alkylaryl radical having from 12 to 24 carbon atoms, m is a number from 1 to 20, x and y are 1 or 2 and the sum of x and y is 3, and R′ is hydrogen, sodium, potassium, lithium or ammonium;

(3) said surfactant fluid salinity being at least 50,000 parts per million total dissolved solids; and

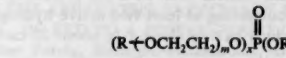
b. recovering petroleum displaced by the surfactant fluid from the formation via the production well.

9. A method for recovering petroleum from a subterranean, petroleum-containing, permeable formation penetrated by at least one injection well and at least one production well, both wells being in fluid communication with the formation, said formation containing water whose salinity is from about 150,000 to 225,000 parts per million total dissolved solids, the formation temperature being greater than 115° F, comprising:

a. introducing into the formation via the injection well an aqueous surfactant-containing fluid to displace petroleum toward the production well, said fluid comprising:

(1) from about .05 to about 5.0 percent by weight an anionic organic sulfonate surfactant having an average equivalent weight not to exceed 360 selected from the group consisting of water-soluble sodium, potassium or ammonium salts of petroleum sulfonates, alkyl sulfonates having from 5 to 20 carbon atoms, alkylaryl sulfonates having from 5 to 14 carbon atoms in the alkyl chain and mixtures thereof; and

(2) from about .05 to about 5.0 percent by weight of a phosphate ester surfactant with an average molecular weight not to exceed about 1,000 having the following formula:



wherein R is an alkyl or alkylaryl radical having from 12 to 24 carbon atoms, *m* is a number from 1 to 20, *x* and *y* are 1 or 2 and the sum of *x* and *y* is 3, and R′ is hydrogen, sodium, potassium, lithium or ammonium;

(3) said surfactant fluid salinity being at least 150,000 parts per million total dissolved solids; and

b. recovering petroleum displaced by the surfactant fluid from the formation via the production well.

4,094,799

SOLID PARTICLES-CONTAINING LUBRICATING OIL COMPOSITION AND METHOD FOR USING SAME

Donald L. De Vries, South Holland, and James M. DeJovine, Homewood, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 20, 1976, Ser. No. 752,225
Int. Cl.² C10M *1/10, 3/02, 5/02, 7/04*
U.S. Cl. 252—29 **18 Claims**

1. A composition of matter comprising a major amount by weight of oil of lubricating viscosity; a minor amount by weight of solid particles effective to improve the lubricating properties of said composition, said solid particles being selected from the group consisting of graphite, molybdenum disulfide, zinc oxide and mixtures thereof; and a minor amount by weight, at least equal to the amount by weight of said solid particles, of at least one co-polymer of (1) an N-vinyl pyrrolidone, and (2) an oil soluble acrylic ester, said co-polymer being present in an amount effective to reduce the deposit forming tendencies of said composition.

4,094,800

ANTI-WEAR LUBRICATING OIL COMPOSITIONS

Thomas M. Warne, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 705,128, Jul. 14, 1976, abandoned. This application May 9, 1977, Ser. No. 794,983
Int. Cl.² C10M *1/48, 3/42, 5/24, 7/46*
U.S. Cl. 252—32.7 E **13 Claims**

1. A lubricating oil composition having improved anti-wear properties comprising a major portion of lubricating oil and an effective amount of an oil soluble additive composition comprising a basic zinc alkyl dithiophosphate having alkyl groups made from primary alcohols containing from about 6 to about 20 carbon atoms and a nonacidic lubricant anti-rust compound comprising the reaction product of a succinic anhydride substituted with an alkenyl group which has 8 to 20 carbon atoms and an alcohol, an amine or mixtures thereof, wherein the ratio of zinc alkyl dithiophosphate to anti-rust is about 1–50:1.

4,094,801

MAGNESIUM-CONTAINING COMPLEXES, METHOD FOR THEIR PREPARATION, AND COMPOSITIONS CONTAINING THE SAME

John Wesley Forsberg, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 681,627, Apr. 29, 1976, abandoned. This application Jan. 18, 1977, Ser. No. 760,315
Int. Cl.² C10M *1/44, 1/48, 1/40, 1/24*
U.S. Cl. 252—33 **53 Claims**

1. A method for preparing a non-carbonated magnesium-containing complex which comprises heating, at a temperature above about 30° C., a mixture comprising:

(A) At least one of magnesium hydroxide, magnesium oxide, hydrated magnesium oxide, or a magnesium alkoxide;

(B) At least one oleophilic organic reagent comprising a carboxylic acid, a sulfonic acid, a pentavalent phosphorus acid, or an ester or alkali metal or alkaline earth metal salt of any of these;

(C) Water; and

(D) At least one organic solubilizing agent for component B;

the ratio of equivalents of magnesium to component B, calculated as the free carboxylic or sulfonic acid or as the phosphoric acid ester, being at least about 5:1, and the amount of water present being at least sufficient to hydrate a substantial proportion of component A calculated as magnesium oxide.

26. A complex prepared by the method of claim 1.

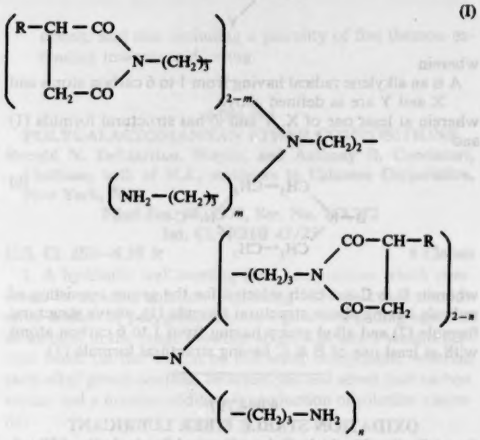
4,094,802

NOVEL LUBRICANT ADDITIVES

Gerard Soula, Meyzieu, and Philippe Duteurtre, Le Havre, both of France, assignors to Societe Orogil, Paris, France

Filed Mar. 30, 1977, Ser. No. 782,881
Claims priority, application France, Apr. 1, 1976, 76 09513
Int. Cl.² C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 A **16 Claims**

1. A novel additive composition based on alkenylsuccinimides, comprising an alkenylsuccinimide of the formula (I):



(I)

in which formula R represents an alkenyl group containing from about 20 to 200 carbon atoms, *m* represents an integer selected from the group consisting of zero, 1 and 2, and *n* represents an integer selected from the group of zero and 1.

11. A lubricating composition having desirable dispersion, anti-rust and anti-foam properties, comprising an oil containing between about 1 and 10% by weight of a novel additive according to claim 1.

4,094,803

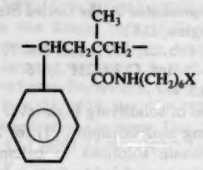
DEVELOPER COMPOSITION COMPRISING AMINOLYZED COATED CARRIER

Harry W. Gibson, Penfield, and Wolfgang H. H. Gunther, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 500,774, Aug. 26, 1974. This application Oct. 29, 1976, Ser. No. 736,781
Int. Cl.² G03G *9/14, 9/10*
U.S. Cl. 252—62.1 P **9 Claims**

1. An electrostatographic developer composition comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles having an average particle diameter of between 50 microns and about 1,000 microns, each of said carrier particles comprising a core surrounded by an outer coating of a polymer selected from the group consisting of styrene-alkylmethacrylate and styrene-alkylacrylate, said

polymer having been functionalized by ester group aminolysis to produce an aminolyzed polymer having the general structure



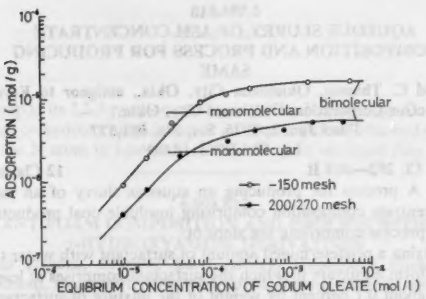
where X may be NH_2, OH, and H said carrier particles being characterized as having controlled triboelectric charging properties.

4,094,804

METHOD FOR PREPARING A WATER BASE MAGNETIC FLUID AND PRODUCT

Junzo Shimoiizaka, 1-1-14, Komegafukuro Sendai-shi, Miyagi-ken, Japan

Continuation-in-part of Ser. No. 605,306, Aug. 18, 1975, abandoned. This application Jan. 5, 1977, Ser. No. 757,037
Claims priority, application Japan, Aug. 19, 1974, 49-94266; Dec. 18, 1974, 49-144546; Mar. 27, 1975, 50-37120
Int. Cl.² H01F *1/25, 1/00;* C10M *3/00;* C09D *11/00*
U.S. Cl. 252—62.52 **22 Claims**



19. A stable aqueous magnetic fluid having a pH of above about 4 comprising water having stable dispersed therein ferromagnetic oxide particles of a particle size below about 300 A, each of said magnetic particles having a two layer surfactant coating comprising an inner layer and an outer layer, the inner layer being a monomolecular layer of an 18 carbon atoms unsaturated fatty acid or salt thereof which completely coats said magnetic particle, and the outer layer being an outer coating free of cationic surfactants and consisting essentially of (i) an anionic surfactant having 8 to 30 carbon atoms in its hydrophobic radical other than said first surfactant, or (ii) a non-ionic surfactant having 8 to 20 carbon atoms in it hydrophobic radical and having a hydrophile balance of at least 12 which completely covers said inner layer, said aqueous fluid containing between about 0.005 and 0.7 g/ml of said coated ferromagnetic oxide particles.

4,094,805

PROTECTING PAVEMENT OR CONCRETE MATERIALS AGAINST THE EFFECTS OF THE DESTRUCTIVE ACTION OF FREEZING AND THAWING OF WATER AND OR BRINE SOLUTIONS

Charles Nyberg Hansen, 1448 S. 17th East, Salt Lake City, Utah 84108

Filed Sep. 23, 1976, Ser. No. 711,575
Int. Cl.² C09K *3/18*
U.S. Cl. 252—70 **31 Claims**

1. An aqueous or dry composition to be applied to the surface of concrete to reduce the damage resulting from the freezing of solutions formed by the action of de-icing compositions, on water, snow or ice in contact with the concrete, comprising a homopolymer of ethylene oxide with a molecular weight of 100,000 or more and one or more de-icing reagents from the group of sodium chloride, calcium chloride and urea; wherein the polyethylene oxide is present in amounts which reduce the damage caused to concrete resulting from the action of said de-icing reagents with the proviso that when sodium chloride is the sole de-icing reagent said aqueous composition so applied must contain at least 2.5 percent sodium chloride.

31. A method of reducing the destructive action which the freezing of water of of solutions produced by de-icing compositions have on concrete which comprises applying to the concrete surface a de-icing water solution or suspension comprising 0.01 to 50 percent homopolymer of ethylene oxide with a molecular weight of 100,000 or more and 0.00 to the saturation concentration of a de-icing reagent selected from the group consisting of sodium chloride, calcium chloride, urea or any combination of these de-icing reagents and which method of application is performed in such a manner and at such a time that the contained polyethylene oxide is present and active during the freezing process.

4,094,806

PHOTOACTIVATED BLEACH-COMPOSITIONS

Brandon Helmholz Wiers, Forest Park, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 564,587, Apr. 3, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,891
Int. Cl.² C11D *7/54, 7/50*
U.S. Cl. 252—102 **14 Claims**

1. An unbuilt liquid detergent composition consisting essentially of:

(a) from 10 to 80% by weight of the composition of a water-soluble organic surfactant chosen from the group consisting of water-soluble anionic and nonionic surfactants and mixtures thereof;

(b) 0.04 to 0.80% by weight of the composition of sulfonated zinc phthalocyanine species characterized by RDV's for its individual species as follows:
Unsulfonated:0
Monosulfonated:0
Disulfonated: 0
Tetrasulfonated:84–94
Trisulfonated:(100)-(RDV for tetrasulfonated);

(c) 0 to 5% by weight of the composition of an electrolyte salt which is not an alkaline detergency builder salt;

(d) 1 to 90% by weight of the composition of a solvent which is chosen from the group consisting of water and alcohol in which the alcohol is a lower hydrocarbon monohydric alcohol containing from 1 to 5 carbon atoms; and

(e) 0 to 50% by weight of the composition of free alkanolamine selected from the group consisting of mono-, di-, and triethanolamine and mixtures thereof.

4,094,807

PREPARATION OF DETERGENT BARS CONTAINING ZINC OXIDE

Peter Franklin Humphreys, Great Sutton, and Edwin Willis, Bromborough, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 648,224, Jan. 12, 1976, abandoned, which is a continuation of Ser. No. 554,879, Mar. 3, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 803,715
Claims priority, application United Kingdom, Mar. 7, 1974, 10304/74; Aug. 23, 1974, 37136/74
Int. Cl.[2] C11D *3/12, 9/20, 17/00*
U.S. Cl. 252—131 15 Claims

1. A method of preparing detergent bars containing from about 0.1% to about 2% by weight of zinc oxide wherein

i. zinc oxide is formed into a slurry containing from about 10 % to about 80% by weight of said oxide with a liquid medium,

ii. the slurry is added to and mixed with a detergent material at the mixing stage, and

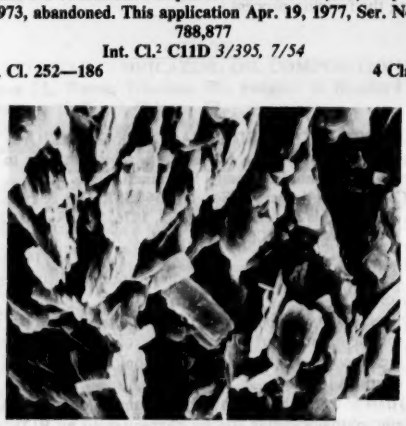
iii. the detergent material is milled, plodded and stamped to form bars.

4,094,808

SOLUBILITY STABLE ENCAPSULATED DIPERISOPHTHALIC ACID COMPOSITIONS

Dorothy A. Stewart, Pittsburgh, Pa.; Bobby D. Ricketts, and Charles H. Hoelscher, both of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 632,923, Nov. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 360,858, May 16, 1973, abandoned. This application Apr. 19, 1977, Ser. No. 788,877
Int. Cl.[2] C11D *3/395, 7/54*
U.S. Cl. 252—186 4 Claims



1. A bleaching formulation in the form of an encapsulated core wherein the core comprises particles consisting essentially of tabular habit diperisophthalic acid in admixture with from 1.0 to 90 weight percent of an ionic dispersing agent selected from the group consisting of hydratable inorganic salts, non-hydratable inorganic salts and organic acids said agent having a water solubility of 4 to 200 grams per 100 grams of water at 15° C. and whose water solutions have a pH below 9, said core having its diperisophthalic acid content present as tabular habit diperisophthalic acid at the time the bleaching formulation is formed and being essentially completely encapsulated with a water dispersible encapsulating material capable, in the absence of free water, of preventing contact of the diperisophthalic acid with substances capable of causing its decomposition.

4,094,809

PROCESS FOR SOLIDIFYING HIGH-LEVEL NUCLEAR WASTE

Wayne A. Ross, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 23, 1977, Ser. No. 771,130
Int. Cl.[2] G21F *9/16*
U.S. Cl. 252—301.1 W 6 Claims

1. In the process of solidifying high-level radioactive waste solutions containing molybdenum (VI) for long-term storage by heating the waste solutions to calcining temperatures whereby the solutions are dried to form a radioactive calcine, mixing the calcine with a glass frit containing alkali metals to form a mixture, heating the mixture to melting temperature to form a molten glass and cooling the molten glass to form a solid containing high-level radioactive waste, the improvement comprising adding to the calcine-frit mixture before melting, an effective amount of reducing agent having a free energy of formation higher than molybdenum to reduce the molybdenum (VI) compounds to a lower valence state whereby the molybdenum (VI) compounds are reduced to a lower valence state which dissolves or disperses in the molten glass whereby the molten glass when cooled forms a leach-resistant solid containing high-level radioactive waste suitable for long-term storage.

4,094,810

AQUEOUS SLURRY OF ASH CONCENTRATE COMPOSITION AND PROCESS FOR PRODUCING SAME

David C. Thomas, Oklahoma City, Okla., assignor to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 1, 1976, Ser. No. 691,577
Int. Cl.[2] B01J *13/00*
U.S. Cl. 252—313 R 12 Claims

1. A process for producing an aqueous slurry of an ash concentrate composition comprising insoluble coal products, said process comprising the steps of:

mixing a predetermined amount of surfactant with water to form a mixture in which the surfactant comprises at least about 0.1 percent by weight of the mixture of surfactant and water;

adding up to about 60 percent said ash concentrate composition to the mixture of surfactant and water; and

mixing said ash concentrate composition, the water and the surfactant while adding said ash concentrate composition to produce said aqueous slurry of the ash concentrate composition.

8. An aqueous slurry comprising:

water;

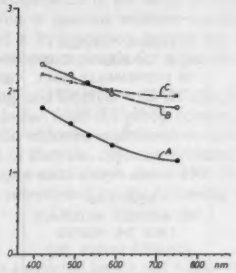
a predetermined amount of surfactant mixed with the water to form a mixture in which the surfactant comprises at least about 0.1 percent by weight of the mixture of surfactant and water; and

an ash concentrate composition comprising insoluble coal product mixed with the water and the surfactant to form an aqueous slurry containing up to about 60 percent of said ash concentrate composition.

4,094,811
PROCESS FOR THE PREPARATION OF SILVER DISPERSIONS FOR FILTER LAYERS AND ANTIHALATION LAYERS

Artur Botta; Anita von König, both of Krefeld; Franz Moll, Leverkusen; Christian Rasp, Cologne, and Johannes Hartl, Bechen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Dec. 21, 1976, Ser. No. 753,093
Claims priority, application Germany, Dec. 30, 1975, 2559191
Int. Cl.[2] B01J *13/00*; G03C *1/84*
U.S. Cl. 252—313 R **10 Claims**



1. A process of preparing a neutral grey dispersion of silver in a protective colloid which comprises the step of reducing with a silver salt reducing agent, silver nitrate in an aqueous solution in a mixture with an aqueous solution of a protective colloid without using cadmium salt and in the presence of an agent for providing the reduced silver in a neutral grey dispersion having a uniform absorption over the spectrum of visible light, wherein the agent for providing the uniform dispersion consists essentially from about 5 mg to about 500 mg per mol of silver salt of a heterocyclic 5-membered or 6-membered compound containing an

$$-N=\underset{|}{C}-N-$$

group in its 1,2,3-position and having in its 2-position an amino alkyl or hydroxy alkyl group or an alkylene chain attached too to the N atom in 1-position thus forming an anellated ring.

4,094,812
ANTIFOAM COMPOSITION AND PROCESS WITH α-HYDROXYAMINE DERIVATIVES

Rudi Heyden, Erkrath; Adolf Asbeck, Dusseldorf; Michael Eckelt, Dusseldorf; Manfred Petzold, Dusseldorf, and Günter Uphues, Dusseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

Filed Dec. 20, 1976, Ser. No. 752,244
Claims priority, application Germany, Dec. 22, 1975, 2557898
Int. Cl.[2] B01D *19/04*
U.S. Cl. 252—321 **13 Claims**

1. A process for the control of foam in a foamable liquid comprising adding to said foamable liquid an antifoam effective amount of an α-hydroxyamine derivative of the formula

$$\begin{array}{l} R_1-CH-A-R_3 \\ \quad\quad | \\ R_2-CH-OH \end{array}$$

wherein A is —NHCONH—, R_1 and R_2 are members selected from the group consisting of hydrogen and alkyl having from 1 to 22 carbon atoms, at least one of R_1 and R_2 being alkyl and the sum of the carbon atoms in R_1 and R_2 is from 8 to 22, and R_3 is a member having 8 to 22 carbon atoms selected from the group consisting of alkyl and hydroxyalkyl.

4,094,813
PROCESS AND APPARATUS FOR THE MANUFACTURE AND COOLING OF GASES CONTAINING HYDROGEN AND CARBON MONOXIDE

Nicolaas Van Lookeren Campagne, Rotterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

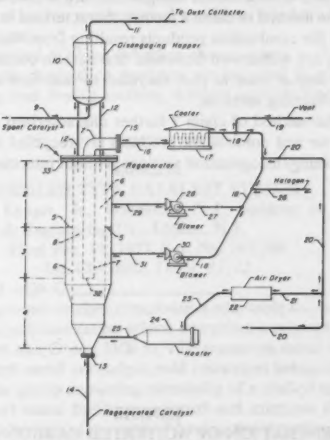
Filed Jul. 18, 1973, Ser. No. 380,437
Claims priority, application United Kingdom, Aug. 2, 1972, 36028/72
Int. Cl.[2] C07C *1/02*; B01J *7/00*
U.S. Cl. 252—373 **7 Claims**

1. In a process for the manufacture of a hydrogen and carbon monoxide-containing gas mixture by the partial combustion of a carbonaceous fuel with an oxygen-containing gas at a pressure of between 1 to 300 atmospheres and a temperature between about 1300° and about 1500° C whereby a hot, carbon monoxide and hydrogen-containing gas mixture is obtained which is cooled in a waste heat boiler containing a helical tube in external contact with water through which the hot gas mixture is flowed, the improvement which comprises cooling the hot gas mixture to a temperature not exceeding 1200° C by passing it over a cooling tube which is externally insulated with a refractory material of between 10 millimeters and 100 millimeters thickness in a primary cooling zone prior to introduction of the gas mixture into said waste heat boiler.

4,094,814
REGENERATION METHOD FOR GRAVITY-FLOWING DEACTIVATED CATALYST PARTICLES

Earl S. Lemberger, Buffalo Grove; Robert K. Olson, Elgin, and Lester F. Smith, Itasca, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 15, 1977, Ser. No. 806,885
Int. Cl.[2] B01J *23/96, 21/20*; C10G *35/08*
U.S. Cl. 252—415 **8 Claims**



1. A method for continuously regenerating hydrocarbon conversion catalyst particles comprising a Group VIII metal and a halogen component in combination with a refractory inorganic oxide carrier material, and which have become deactivated (1) by deposition of carbonaceous matter thereon and, (2) through loss of halogen therefrom, in a regeneration zone comprising a first carbon-burning/halogenation section interconnected with and surmounted with respect to a second carbon-burning/halogenation section, said second being interconnected with and surmounted with respect to a lower drying

section, wherein said catalyst particles are downwardly and countercurrently movable through a descending column via gravity-flow with respect to the upward flow of vapors within said regeneration zone, said regeneration method comprising the inter-related sequential steps of:

(a) introducing (i) said deactivated catalyst particles, (ii) a first air stream from an external source and, (iii) a first mixture of steam and a halogen, or halogen-containing compound from an external source, into said first carbon-burning/halogenation section;

(b) maintaining said catalyst particles within said first section for a time sufficient to (i) remove the greater portion of said carbonaceous matter therefrom and, (ii) increase the halogen content thereof;

(c) introducing (i) said catalyst particles from said first section, via gravity-flow and (ii) a second air stream from an external source and, (iii) a second mixture of steam and a halogen, or a halogen-containing compound from an external source, into said second section;

(d) maintaining said catalyst particles within said second section for a time sufficient to (i) remove substantially all of the remaining carbonaceous material therefrom and, (ii) further increase the halogen content thereof;

(e) introducing (i) said catalyst particles from said second section, via gravity-flow and countercurrent with, (ii) a substantially dry third air stream from an external source into said lower drying section, and maintaining said catalyst particles therein for a time sufficient to remove substantially all the water therefrom; and,

(f) withdrawing substantially water-free, regenerated catalyst particles from said regeneration zone.

4. The method of claim 1 further characterized in that said first air stream is introduced into said first carbon-burning-/halogenation section through the same locus through which said first steam/halogen mixture is introduced.

5. The method of claim 1 further characterized in that said second air stream is introduced into said second carbon-burning/halogenation section through the same locus through which said second steam/halogen mixture is introduced.

7. The method of claim 1 further characterized in that excess air and the combustion products resulting from the burning of carbon, are withdrawn from said first carbon-burning section, cooled and at least in part recycled to said first and second carbon-burning sections.

8. The method of claim 7 further characterized in that said excess air and combustion products are recycled to said carbon-burning/halogenation sections without intermediate treatment.

4,094,815

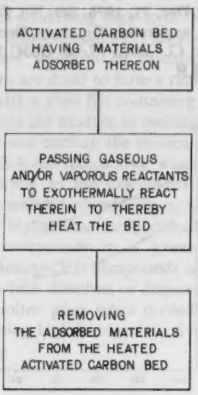
REGENERATION OF ACTIVATED CARBON HAVING MATERIALS ADSORBED THEREON

Vito Cedro, III, Pittsburgh; Donald L. Kinosz, Tarentum, both of Pa., and Thomas G. Lamberti, II, Palestine, Tex., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 2, 1977, Ser. No. 802,633
Int. Cl.[2] B01J *21/20*
U.S. Cl. 252—415 **6 Claims**

1. A process for regeneration of an activated carbon bed having materials adsorbed thereon which comprises passing a mixture of reactive gases and/or vapors therethrough capable of reacting exothermically in the presence of activated carbon in situ, without reacting with either the carbon bed or the materials adsorbed thereon, wherein the exothermic heat of reaction is used to heat the carbon bed to assist in stripping the bed of materials adsorbed thereon.

2. The process of claim 1 wherein the space time of the gases and/or vapors is at least .05 minutes to insure substantially complete reaction in the bed.


ACTIVATED CARBON BED HAVING MATERIALS ADSORBED THEREON
PASSING GASEOUS AND/OR VAPOROUS REACTANTS TO EXOTHERMALLY REACT THEREIN TO THEREBY HEAT THE BED
REMOVING THE ADSORBED MATERIALS FROM THE HEATED ACTIVATED CARBON BED

3. The process of claim 2 wherein the flow of reactive gases and/or vapors into the bed is terminated when the temperature in the reaction zone reaches 623–673° K and an inert gas is then passed through the bed to complete the stripping of adsorbed materials from the carbon bed.

6. The process of claim 2 wherein the reactive gases and/or vapors consist essentially of Cl_2 and a second reactant selected from the class consisting of H_2 and CO.

4,094,816

METHOD FOR STABILIZING A PHOSPHORUS-VANADIUM-OXYGEN COMPLEX CATALYST

Walter Partenheimer, Naperville, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 616,370, Sep. 24, 1975, Pat. No. 4,020,174. This application Dec. 22, 1976, Ser. No. 753,551
The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.
Int. Cl.[2] B01J *23/92, 27/28*
U.S. Cl. 252—415 **27 Claims**

1. A method for stabilizing a phosphorus-vanadium-oxide catalyst having an atomic ratio of phosphorus to vanadium in the range of about 0.5 to 5, which comprises:

(A) Contacting said catalyst at deactivation conditions including a temperature in the range of from about 350° to 600° C. with a gaseous mixture containing molecular oxygen for a period of greater than about 1 hour;

(B) Contacting said catalyst with an effective amount of a material selected from the group consisting of:

(1) Molecular chlorine or fluorine or mixtures thereof;

(2) Halides of fluorine, chlorine, bromine or iodine being in the vapor state above about 250° C. at atmospheric pressure represented by the following formula:

$C(X)_n$

where each X is a selected halide and n is an integer from 1 to 4, any remaining radicals being hydrogen or mixtures thereof;

(3) Organic halides of fluorine, chlorine, bromine or iodine being in the vapor state above about 250° C. at atmospheric pressure represented by the formula:

$R(X_1)_m$

where R is alkane, alkene or alkyne of straight or branched structure having at least two carbon atoms and X_1 is independently a primary, secondary, or tertiary halide and m is an integer of from 1 to about 20 consistent with the number of carbon atoms of said structure or mixtures;

(4) hydrogen halides;

or mixtures thereof at reactivation conditions including a temperature in the range of from about 300° to about 500° C.; and

(c) repeating the sequence of steps (A) and (B) at least once.

9. A method for stabilizing a phosphorus-vanadium-oxide catalyst having an atomic ratio of phosphorus to vanadium in the range of about 0.5 to 5, which comprises:

(A) Contacting said catalyst at deactivating conditions including a temperature in the range of from about 350° to 600° C. with a gaseous mixture containing molecular oxygen and a hydrocarbon having less than about ten carbon atoms per molecule for a period of greater than about 1 hour.

(B) Contacting said catalyst with an effective amount of a material selected from the group consisting of:

(1) Molecular chlorine or fluorine or mixtures thereof;

(2) Halides of fluorine, chlorine, bromine or iodine being in the vapor state above about 250° C. at atmospheric pressure represented by the following formula:

$$C(X)_n$$

where each X is a selected halide and n is an integer from 1 to 4, any remaining radicals being hydrogen or mixtures thereof;

(3) Organic halides of fluorine, chlorine, bromine or iodine being in the vapor state above about 250° C. at atmospheric pressure represented by the formula:

$$R(X_1)_m$$

where R is alkane, alkene or alkyne of straight or branched structure having at least two carbon atoms and X_1 is independently a primary, secondary, or tertiary halide and m is an integer of from 1 to about 20 consistent with the number of carbon atoms of said structure or mixtures;

(4) Hydrochloric acid;

or mixtures thereof at reactivation conditions including a temperature in the range of from about 300° to about 500° C.; and

(c) repeating the sequence of steps (A) and (B) at least once.

4,094,817

REGENERATION METHOD FOR GRAVITY-FLOWING DEACTIVATED CATALYST PARTICLES

Robert K. Olson, Elgin, and Lester F. Smith, Itasca, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 15, 1977, Ser. No. 806,886
Int. Cl.[2] B01J *23/96, 21/20;* **C10G** *35/08*
U.S. Cl. 252—415 **7 Claims**

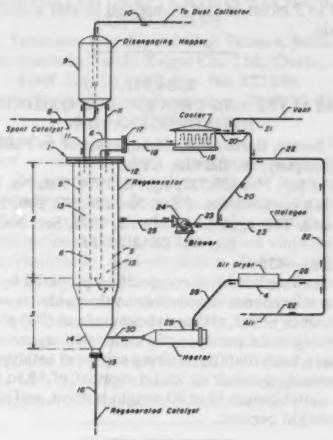
1. A method for continuously regenerating hydrocarbon conversion catalyst particles comprising a Group VIII metal and a halogen component in combination with a refractory inorganic oxide carrier material, and which have become deactivated through use in said hydrocarbon conversion reaction by (1) deposition of carbonaceous matter thereon and through (2) loss of halogen therefrom, said continuous regeneration being effected in a regeneration zone wherein said particles are downwardly movable through a descending column via gravity-flow in countercurrent relationship with the upward flow of vapors within said zone and wherein said regeneration zone comprises a carbon-burning/halogenation first section interconnected with and surmounted with respect to a lower drying second section, which regeneration method comprises the interrelated sequential steps of:

(a) introducing (i) deactivated catalyst particles, (ii) a first air stream from an external source and, (iii) a halogen or a halogen-containing compound from an external source into said upper carbon-burning/halogenation first section;

(b) maintaining said catalyst particles within said first section for a time sufficient to (i) remove substantially all of said carbonaceous matter therefrom and, (ii) increase the halogen content thereof;

(c) introducing (i) said catalyst particles from said carbon-burning/halogenation first section, via of said gravity-flow, and, (ii) a second air stream from an external source into said lower drying section, and maintaining said catalyst particles within said lower drying section for a time sufficient to remove substantially all the water therefrom; and

(d) withdrawing substantially water-free, regenerated particles from said regeneration zone.



6. The method of claim 1 further characterized in that excess air and the combustion products resulting from the burning of carbon, are withdrawn from said carbon-burning section, cooled and at least in part recycled to said carbon-burning and drying sections.

7. The method of claim 6 further characterized in that said excess air and combustion products are recycled to said carbon-burning and drying sections without intermediate treatment.

4,094,818

ZIEGLER TYPE CATALYST SYSTEM

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 11, 1977, Ser. No. 767,766
Int. Cl.[2] B01J *31/02, 31/12*
U.S. Cl. 252—429 C **8 Claims**

1. An improved catalyst composition adaptable for use in an alpha-olefin polymerization which comprises a mixture of:

(a) at least one Group IVB to VIII transition metal halide;

(b) an alkyl metal cocatalyst, said cocatalyst being selected from the group consisting essentially of a trialkyl metal or a dialkyl metal halide compound and mixtures thereof, said trialkyl metal compound having the structure of

$$R'_3Y$$

said dialkyl metal halide compound having the structure of

$$R'_2YX$$

wherein R' is selected from the group consisting of C_1 to C_{20} alkyl, branched alkyl, naphthenic or aralkyl groups, Y being selected from the group consisting of aluminum, gallium or indium and X being a halide group; and

(c) a nitrogen-containing metal alkyl compound, a structure

of said nitrogen-containing metal alkyl compound being selected from the group consisting of

R'_2YNR_2 or $R'XYNR_2$

wherein Y being selected from the group consisting of Al, Ga or In, X being halide, R' being a C_1 to C_{20} alkyl, branched alkyl, naphthenic or aralkyl group and R being selected from the group consisting of C_3 to C_{10} bulky alkyl groups and cycloalkyl groups, with the proviso that the two R groups can be taken with N to form a pyrrolidyl or piperidyl and the alkyl substituted derivatives of pyrrolidyl and piperidyl, said compound being in a mole ratio of 0.05 to 5 moles of said compound to said transition metal halide.

4,094,819

CATALYST AND PROCESS FOR OXIDATIVE DEHYDROGENATION

Brent J. Bertus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 458,721, Apr. 8, 1974, Pat. No. 3,972,954, which is a continuation of Ser. No. 226,299, Feb. 14, 1972, abandoned. This application Mar. 5, 1976, Ser. No. 664,216

Int. Cl.[2] B01J *27/14*

U.S. Cl. 252—435 **7 Claims**

1. An activated catalyst composition prepared by admixing oxides, or compounds convertible to the oxide on calcination, of (I) cobalt or nickel, (II) molybdenum, and (III) phosphorus, and calcining in the presence of a molecular oxygen-containing atmosphere, such that the resulting activated catalyst composition represents a cobalt or nickel content of 15 to 65 weight percent, molybdenum 10 to 40 weight percent, and phosphorus 1 to 25 weight percent.

4,094,820

MANUFACTURE OF COBALT AND/OR NICKEL-MOLYBDENUM-ALUMINA CATALYSTS

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 11, 1977, Ser. No. 776,762

Int. Cl.[2] B01J *21/04, 23/88*

U.S. Cl. 252—465 **10 Claims**

1. A single-calcination, ammonia-free method for the manufacture of a finished cobalt- and/or nickel- molybdenum- alumina catalyst, which comprises:

(1) reacting in an aqueous slurry at least one carbonate or hydroxide of cobalt or nickel with at least a stoichiometric proportion of MoO_3 and/or molybdic acid to form finely divided undissolved crystalline cobalt- and/or nickel molybdate in aqueous suspension;

(2) mixing said aqueous suspension with sufficient alumina hydrate consisting essentially of gelatinous boehmite to provide about 50–90 wt.% Al_2O_3 in the finished catalyst;

(3) digesting and/or mulling the resulting mixture for at least about 0.5 hour with at least sufficient water to provide an extrudable plastic mixture;

(4) recovering from step (3) and extrudable plastic mixture;

(5) extruding the plastic mixture to provide extrudates of desired size and shape; and

(6) drying and calcining the extrudates at a maximum temperature between about 800° F and 1500° C.

4,094,821

CATALYSTS AND METHOD OF THEIR PREPARATION

Gary B. McVicker, Westfield, and Robert L. Garten, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 579,789, May 22, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,834

Int. Cl.[2] B01J *21/04, 21/12, 23/58*

U.S. Cl. 252—466 PT **61 Claims**

1. A hydrocarbon conversion catalyst resistant to metal agglomeration upon regeneration under oxidizing conditions due to the formation of a complex oxide under said oxidizing conditions between a component metal of Group VIII and a Group IIA metal oxide selected from the group consisting of calcium oxide, barium oxide, strontium oxide and mixtures thereof, comprising a Group VIII metal or mixture thereof supported on a Group IIA metal oxide selected from the group consisting of calcium oxide, barium oxide, strontium oxide and mixtures thereof which Group IIA metal oxide is supported on an acidic refractory oxide wherein the Group IIA metal oxide is present in sufficient quantity to neutralize the acid sites of the acidic refractory oxide support and to supply an excess at a level of from about 0.5 to 50 moles Group IIA metal oxide per mole of said Group VIII metal or mixtures thereof, the Group VIII metal or mixtures thereof on Group IIA metal oxide or mixtures thereof on neutralized acidic refractory oxide combination being supported on an acidic refractory oxide.

4,094,822

BIO-EVENT ELECTRODE MATERIAL

John A. R. Kater, 583 Traverse Dr., Costa Mesa, Calif. 92626

Continuation-in-part of Ser. No. 566,335, Dec. 26, 1974, Pat. No. 3,993,049. This application Oct. 21, 1976, Ser. No. 734,405

Int. Cl.[2] H01B *1/02*

U.S. Cl. 252—512 **4 Claims**

1. An electrolyte material for use in producing electrodes comprising a mixture of adhesive, a metal salt, powdered metal of the same kind as the metal of the salt and a solvent in which both said adhesive and said salt are soluble.

4,094,823

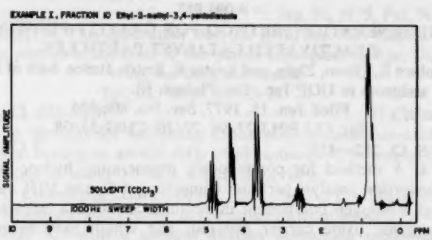
ETHYL-2-METHYL-3,4-PENTADIENOATE PERFUME COMPOSITIONS

John B. Hall, Rumson; Denis E. Hruza, Brick Town; Manfred Hugo Vock, Locust; Joaquin Vinals, Red Bank, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

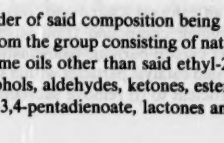
Division of Ser. No. 566,118, Apr. 8, 1975, Pat. No. 3,978,239. This application May 5, 1976, Ser. No. 683,330

Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 **3 Claims**



1. A perfume composition comprising from 0.05% up to 5% by weight of the fragrance components of ethyl-2-methyl-3,4-pentadienoate having the structure:

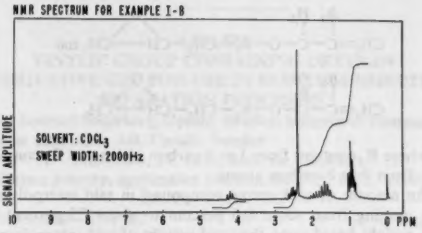


and the remainder of said composition being at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils other than said ethyl-2-methyl-3,4-pentadienoate, alcohols, aldehydes, ketones, esters other than said ethyl-2-methyl-3,4-pentadienoate, lactones and nitriles.

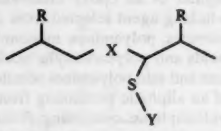
4,094,824
α-OXY(OXO) SULFIDES IN PERFUME

William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, both of N.J.; Edward J. Shuster, Brooklyn, N.Y., and Frederick Louis Schmitt, Holmdel, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 723,534, Sep. 15, 1976, Pat. No. 4,065,408.
This application Jul. 28, 1977, Ser. No. 819,961
Int. Cl.[2] C11B *9/00*
U.S. Cl. 252—522 4 Claims

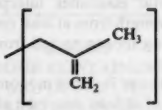


1. A perfume comprising a carrier and a compound having the structure:



wherein R is one of hydrogen or methyl, X is

and Y is selected from the group consisting of methyl, methallyl having the structure:



1-propyl, 2-methyl-1-propyl and acetyl.

4,094,825
PROCESS FOR THE PRODUCTION OF PHENOL SILICOFORMATE COMPOUNDS AND THEIR CONDENSATION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 672,559, Mar. 31, 1976, Pat. No. 4,032,511, which is a continuation-in-part of Ser. No. 555,078, Mar. 3, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,873
The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.
Int. Cl.[2] C08G *2/00*
U.S. Cl. 260—2 S 15 Claims

1. The process for the production of phenol silicoformate compounds by the following steps:
(a) mixing silicoformic acid and a phenol compound,
(b) adding an alkali catalyst equal to 1 to 10% by weight of silicoformic acid and phenol compound,
(c) heating said mixture to just below the boiling point of the phenol compound for 20 to 80 minutes while agitating at ambient pressure, thereby
(d) producing a granular phenol silicate compound.

5. The method of claim 1, including the further steps, following step (d), of:
(a) adding an aldehyde in the ratio of 1 to 3 mols to each mol of the phenol compound,
(b) heating said mixture at 50° to 120° C for 20 to 90 minutes while agitating, thereby
(c) producing a resinous product.

4,094,826
FLUORINATED GRAFT CATION EXCHANGE COPOLYMERS

Masayoshi Tatemoto, Ibaraki, and Sinji Tamaru, Suita, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

Filed Aug. 23, 1977, Ser. No. 827,018
Claims priority, application Japan, Aug. 25, 1976, 51-102113
Int. Cl.[2] C08F *259/08*
U.S. Cl. 260—2.2 R 10 Claims

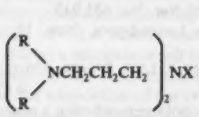
1. An ion exchanger which comprises a water-insoluble copolymer prepared by post-polymerizing at least one fluoroolefin monomer selected from the group consisting of tetrafluoroethylene, trifluoroethylene, trifluorochloroethylene, hexafluoropropylene, vinylidene fluoride and vinyl fluoride to a perfluorovinylacetic acid-vinylidene fluoride copolymer containing not less than 25% by mole of the perfluorovinylacetic acid unit in an aqueous solution of said perfluorovinylacetic acid-vinylidene fluoride copolymer in the presence of an organic or inorganic peroxide polymerization initiator wherein the proportion of the post-polymerized fluoroolefin monomer is from 5 to 60% by weight based on the weight of said perfluorovinylacetic acid-vinylidine fluoride copolymer.

4,094,827
SUBSTITUTED UREAS AS POLYURETHANE CATALYSTS

Edward E. McEntire, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,547
Int. Cl.[2] C08G *18/16, 18/18*
U.S. Cl. 260—2.5 AC 11 Claims

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of a compound having the following structural formula:



where R is lower alkyl and X is hydrogen or $CONR_1R_2$ where R_1 and R_2 are independently selected from the group consisting of hydrogen, alkyl and aryl with the proviso that both R_1 and R_2 may not be aryl.

4,094,828
RIGID POLYURETHANE FOAMS

Howard P. Klein, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed Sep. 30, 1976, Ser. No. 728,486
Int. Cl.[2] C08G *18/62*
U.S. Cl. 260—2.5 AM 15 Claims

1. A rigid polyurethane foam obtained by reacting in the presence of a blowing agent and a catalyst of polyurethane formation, an organic polyisocyanate and a polyol combination comprising 5–85 percent by weight of a copolymer of allyl alcohol and styrene and 15–95 percent by weight of a poly-

ether polyol having a hydroxyl number ranging from about 200 to about 800, said weight percentages being based on the total weight of said polyol combination.

4,094,829

QUICK SETTING COMPOSITIONS

Herbert Jackson Shearing, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Aug. 2, 1976, Ser. No. 710,884

Claims priority, application United Kingdom, Aug. 29, 1975, 35707/75; Dec. 8, 1975, 50235/75

Int. Cl.² C08G *18/38, 18/14*

U.S. Cl. 260—2.5 AK **13 Claims**

1. A composition obtained by first preparing a reaction mixture by mixing together an aqueous solution or suspension of an ammonium or alkali metal borate and an organic polyisocyanate in amount such that the borate/polyisocyanate ratio is from 1:0.5 to 1:50 by weight, the amount of water supplied by said aqueous solution or suspension being sufficient to render the total reaction mixture a spreadable paste or fluid mix, and allowing said reaction mixture to set.

5. A composition obtained by mixing an aqueous solution of an alkali metal or ammonium borate and an alkali metal or ammonium silicate, with (a) at least one non-silicate compound of a polyvalent metal having a solubility in water at 20° C of at least 0.01 gm per liter and/or (b) a hydraulic cement, in amount from 5% to 100 times that theoretically necessary to react completely with the alkali metal or ammonium borate, or borate and silicate together, to form an insoluble metal borate and/or silicate in the presence of (1) an organic polyisocyanate or (2) an organic polyisocyanate and a mono and/or a polyfunctional organic isocyanate-reactive compound present in an amount up to that which is theoretically necessary to react completely with all the isocyanate groups in the organic polyisocyanate, and allowing the mixture to set.

13. A composition as claimed in claim 5 wherein the composition is obtained in foamed form by incorporating into the mixture of ingredients a blowing agent.

4,094,830

GRAFTING OF VINYLAROMATIC COMPOUNDS BY CATIONIC POLYMERIZATION ON NON-HALOGENATED DOUBLE-BONDED CHAINS

Cecile Baudin, Kremlin-Bicetre; Mihajlo Miskovic; Alain Polton, both of Paris, and Pierre Sigwalt, St Michel-sur-Orge, all of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Nov. 14, 1975, Ser. No. 631,943

Claims priority, application Luxembourg, Nov. 18, 1974, 71297

Int. Cl.² C08E *19/28;* C08F *253/00, 279/02, 279/00*

U.S. Cl. 260—4 R **4 Claims**

1. A process for preparing copolymers wherein a macromolecular hydrocarbon elastomer having a non-halogenated alkyl or branched alkyl double-bonded chain and a vinylaromatic monomer selected from the group consisting of indene, styrene and styrene having at least one alkyl substituent are reacted at a temperature from −80° C to +40° C in the presence of 5.10^{-4} to 5.10^{-2} mole/l of a Lewis acid initiator and optionally in the presence of a co-initiator.

4,094,831

GREEN STRENGTH OF ELASTOMERS

Paul H. Sandstrom, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 22, 1976, Ser. No. 734,773

Int. Cl.² C08F *8/00, 224/00;* C08L *7/00, 63/00*

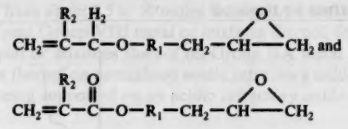
U.S. Cl. 260—5 **29 Claims**

1. A process, comprising:

forming a synthetic elastomer interpolymer having improved green strength by reacting at least one type of a synthetic elastomer forming monomer with an epoxy containing monomer,

said synthetic elastomer forming monomer selected from the class consisting of at least one type of a conjugated diene monomer having from 4 to 10 carbon atoms, and at least one type of an olefin monomer having from 2 to 14 carbon atoms in combination with at least one type of a conjugated diene monomer having from 4 to 10 carbon atoms,

said epoxy containing monomer selected from the class of compounds having the formula



where R_2 contains from 1 to 4 carbon atoms and R_1 contains from 0 to 8 carbon atoms,

the amount of said epoxy compound in said interpolymer ranging from about 0.5 percent to about 75 percent by weight based upon the total weight of said interpolymer,

partially cross-linking said interpolymer to improve the green strength of said interpolymer by adding and reacting from 0.1 to 2.0 parts by weight based upon 100 parts of said interpolymer of an epoxy cross-linking agent, said epoxy cross-linking agent selected from the class consisting of monoamines, polyamines, monoanhydrides, monocarboxylic acids and polycarboxylic acids,

said monoamines and said polyamines selected from the class consisting of an aliphatic containing from 1 to 16 carbon atoms, a cycloaliphatic containing from 4 to 6 carbon atoms, an aromatic containing from 6 to 16 carbon atoms, and combinations thereof,

said monoanhydrides selected from the class consisting of an aliphatic containing from 1 to 30 carbon atoms, a cycloaliphatic containing from 4 to 30 carbon atoms, an aromatic containing from 6 to 30 carbon atoms, and combinations thereof, and

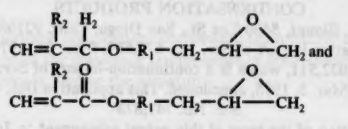
said monocarboxylic acids and said polycarboxylic acids selected from the class consisting of an aliphatic containing from 1 to 30 carbon atoms, an aromatic containing from 6 to 30 carbon atoms, and combinations thereof.

10. A process comprising:

forming a synthetic elastomer interpolymer having improved green strength from at least one type of a synthetic elastomer forming monomer and from an epoxy containing monomer,

said synthetic elastomer forming monomer selected from the class consisting of at least one type of a conjugated diene monomer having from 4 to 10 carbon atoms, and at least one type of an olefin monomer having from 2 to 14 carbon atoms in combination with at least one type of a conjugated diene monomer having from 4 to 10 carbon atons,

said epoxy containing monomer selected from the class of compounds having the formula:



where R_2 contains from 1 to 4 carbon atoms and R_1 contains from 0 to 8 carbon atoms,

the amount of said epoxy compound in said interpolymer ranging from about 0.5 percent to about 75 percent by weight based upon the total weight of said interpolymer,

improving the green strength of an elastomer selected from the class consisting of synthetic elastomers and natural rubber by adding said interpolymer to form a blend,

the amount of said epoxy containing interpolymer in said

blend ranging from about 2 percent to about 98 percent by weight based upon the total weight of said blend,

said synthetic elastomers selected from the class consisting of nitrile rubber, butyl rubber, chlorinated butyl rubber brominated butyl rubber, polyalkenylenes, ethylene-propylene-diene rubber, polymers made from at least one type of a conjugated diene monomer having from 4 to 10 carbon atoms, and polymers made from at least one type of an olefin monomer having from 2 to 14 carbon atoms in combination with at least one type of a conjugated diene monomer having from 4 to 10 carbon atoms.

4,094,832

VINYLIC GROUP CONTAINING DEXTRAN DERIVATIVE GEL FOR USE IN ELECTROPHORETIC SEPARATION PROCESSES

John Lennart Söderberg, Upsala, Sweden, assignor to Pharmacia Fine Chemicals AB, Upsala, Sweden

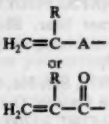
Filed Nov. 29, 1976, Ser. No. 745,903

Claims priority, application Sweden, Dec. 12, 1975, 7514093

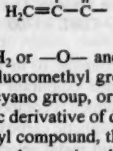
Int. Cl.[2] C08L *5/02*

U.S. Cl. 260—17.4 GC **2 Claims**

1. A dextran derivative gel for use in electrophoretic separation processes, which gel comprises a polymerisate obtained by the free-radical homopolymerization of a dextran derivative containing vinylic groups of the formula



(I)



(II)

in which A is $-CH_2$ or —O— and R is a hydrogen atom, a methyl group, a trifluoromethyl group, a fluorine, chlorine or bromine atom or a cyano group, or free-radical copolymerization of such a vinylic derivative of dextran with a low-molecular weight monovinyl compound, the degree of substitution of the vinylic groups in the starting dextran derivative being 0.3 - 1.5 mmol/g of dextran derivative in the case of substituents of the formula (I) and 0.05 - 1 mmol/g of dextran derivative in the case of substituents of the formula (II) and the amount of dextran derivative containing vinylic groups being 20 - 100% by weight, calculated on the total weight of the reactants.

4,094,833

VINYLIC GROUP CONTAINING DEXTRAN DERIVATIVE GEL IN PARTICLE FORM FOR SEPARATION PURPOSES

Haldor Ingemar Johansson; Dag Torsten Lindström, and John Lennart Söderberg, all of Upsala, Sweden, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

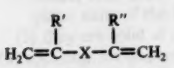
Filed Nov. 29, 1976, Ser. No. 745,904

Claims priority, application Sweden, Dec. 12, 1975, 7514092

Int. Cl.[2] C08L *5/02*

U.S. Cl. 260—17.4 GC **2 Claims**

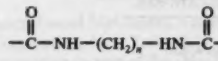
1. A dextran derivative gel in particle form for use in the separation of substances according to at least one property selected from the group consisting of molecular size and electrical charge by means of at least one technique selected from the group consisting of gel chromatographic and ion exchange techniques, which gel comprises a copolymerisate obtained by the free-radical copolymerization of a mixture of 20 - 80% by weight of a dextran derivative containing groups selected from the class consisting of vinyl and substituted vinyl groups, 20 - 80% by weight of a divinyl compound of the formula:



(I)

in which R' and R" are equal or different and each represent hydrogen or methyl, X is

$-SO_2-$ or the group



wherein *n* is an integer from 1 to 6, and 0 - 40% by weight of a low-molecular weight monovinyl compound, calculated on the total weight of the reactants, the degree of substitution of groups selected from the class consisting of vinyl and substituted vinyl groups in the starting dextran derivative being 0.05 - 2 mmol/g of dextran derivative.

4,094,834

ABS-FORMALDEHYDE NOVOLAK

Lewis H. Bowers, Scotia; Raymond E. Jankowski, Schenectady, and John L. Sullivan, Ballston Lake, all of N.Y., assignors to Schenectady Chemicals, Inc., Schenectady, N.Y.

Division of Ser. No. 492,967, Jul. 26, 1974, Pat. No. 3,944,510.

This application Nov. 25, 1975, Ser. No. 635,074

Int. Cl.[2] C08K *5/09;* **C08L** *9/02, 55/02, 61/10*

U.S. Cl. 260—19 UA **9 Claims**

1. A composition suitable for use as a shell process foundry flake resin comprising a blend of a phenol-formaldehyde novolak containing 0.70 to 0.83 moles of formaldehyde per mole of phenol and 1 to 20% of an acrylonitrile-butadiene-styrene terpolymer resin based on the phenol in the novolak.

4,094,835

UNSATURATED POLYESTER RESINOUS COMPOSITION

Eiji Omori; Yuuji Aimono; Yoshiyuki Mukoyama, and Hatuo Sugitani, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

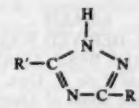
Filed Jan. 25, 1977, Ser. No. 762,266

Claims priority, application Japan, Jan. 28, 1976, 51-8811; Jul. 30, 1976, 51-91947

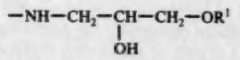
Int. Cl.[2] C09D *3/66, 5/25*

U.S. Cl. 260—22 CB **5 Claims**

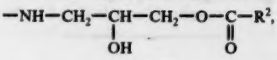
1. An unsaturated polyester resinous composition comprising (a) unsaturated polyester, (b) at least one crosslinkable monomer, (c) at least one compound selected from the group consisting of 1,2,4-triazole and its derivatives, (d) a curing agent and (e) a manganese salt of an organic acid, wherein the proportion of the unsaturated polyester (a) is 80 - 30% by weight, the proportion of the crosslinkable monomer (b) is 20 - 70% by weight, and 0.000012 - 0.036 mole of the compound (c), 0.5 - 3.0 g of the curing agent (d) and 0.001 - 1.5 g of the manganese salt (e) are present based on 100 g of the total of the components (a) and (b), and wherein 1,2,4-triazole and its derivatives in the compound (c) have the formula:



wherein R and R' are independently hydrogen, amino or a group of the formula,



or



wherein R^1 is alkyl having 4 to 8 carbon atoms, phenyl, halogen substituted phenyl, cresyl, or halogen substituted cresyl; and R^2 is alkyl having 8 to 10 carbon atoms.

4,094,836

AQUEOUS ALKYD RESINS

Seimei Yasui, Ibaraki; Minoru Hino, and Kazuya Hayashi, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 670,957, Mar. 26, 1976, abandoned. This application Apr. 7, 1977, Ser. No. 785,699
Claims priority, application Japan, Mar. 26, 1975, 50-37260
Int. Cl.[2] C09D *3/52, 3/66, 5/02*
U.S. Cl. 260—22 CB **14 Claims**

1. An aqueous alkyd resin obtained by the neutralization of a polycondensation resin with a base, the polycondensation resin being prepared by reacting a reaction mixture obtained by the transesterification or esterification of (a) a natural fat and oil or a fatty acid with a polyhydric alcohol with an adduct of (b) a liquid polybutadiene having a number average molecular weight of 150 to 900, a viscosity of 2 to 80 cps;. at 30° C and at least 50% of the cis-1,4 structure with an α,β-unsaturated dicarboxylic acid or the anhydride thereof, and/or the half-ester of said adduct, and (c) an aromatic polycarboxylic acid or the anhydride thereof, the proportion of the component (b) to the component (a) being in the range of 0.1 to 0.7 by weight, as calculated by (b)/(a) + (b), the polycondensation resin having free carboxyl groups in the amount corresponding to an acid value of 30 to 70 and containing 5 to 50% by weight of the component (b), wherein the total amount of the components (a) and (b) is in the range of 30 to 85% by weight on the basis of the whole resin.

4,094,837

CORROSION INHIBITING PRIMER PAINT FOR HAND CLEANED FERROUS METALS

William C. Johnson, Kintnersville, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 10, 1977, Ser. No. 795,583
Int. Cl.[2] C09D *3/64, 5/08*
U.S. Cl. 260—22 A **10 Claims**

1. A red lead primer paint for coating the surface of ferrous metals comprising between 0.25 to 2.2 pounds of an 85% to 98% grade of red lead pigment per gallon (29.95 to 263.46 grams per liter) of paint solids well dispersed in a binder comprised of raw linseed oil and a long oil alkyd resin in a ratio of between 1:1 to 2:1, said primer paint having a pigment volume concentration of between about 25% to 30% and being characterized by having improved wetting and penetrating properties and improved corrosion inhibiting properties, and producing a coating having improved adherence to the surface to which it is applied.

4,094,838

TRIGLYCERIDE OIL-DERIVED WATER-DISPERSIBLE URETHANE RESIN COATINGS

Wilma J. Schneider, and Lyle E. Gast, both of Peoria, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 3, 1977, Ser. No. 803,192
Int. Cl.[2] C08G *18/28*
U.S. Cl. 260—22 TN **13 Claims**

1. A method of preparing water-dispersible urethane resin coating compositions comprising the following steps:

a. amidating a drying or semidrying triglyceride oil with a diolamine in an oil:amine ratio of about 1:2 to yield a mixture of 2-monoglycerides and N,N-bis hydroxyalkyl fatty amides in a 2-monoglyceride:N,N-bis fatty amide ratio of approximately 1:2;

b. reacting the mixture of 2-monoglycerides and N,N-bis hydroxyalkyl fatty amides from step (a) with a sufficient amount of an anhydride under sufficient conditions to convert a portion of said 2-monoglycerides and said N,N-bis hydroxyalkyl fatty amides to the corresponding 2-monoglyceride and N,N-bis hydroxyalkyl fatty amide half esters and to provide an acid value in the range of about 30–70 in said urethane resin coating compositions;

c. neutralizing unesterified anhydride carboxyl groups on said 2-monoglyceride and N,N-bis hydroxyalkyl fatty amide half esters from step (b):

d. reacting the resultant 2-monoglyceride, 2-monoglyceride half ester, N,N-bis hydroxyalkyl fatty amide, and N,N-bis hydroxyalkyl fatty amide half ester mixture from step (c) with a diisocyanate in a molar ratio of diisocyanate:2-monoglyceride +N,N-bis-hydroxyalkyl fatty amide of from about 0.85:1 to about 0.58:1, thereby polymerizing the components of said mixture into a urethane resin; and

e. recovering said urethane resin prepared in step (d).

4,094,839

PREPARATIONS FOR COLORING MOLTEN THERMOPLASTIC POLYMERS

Albert Riegler, Basel; Werner Saar, Riehen, and Volkhard Wiese, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,308
Claims priority, application Sweden, Oct. 22, 1974, 7414104
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23 R **9 Claims**

1. A preparation which contains 10 to 70% by weight of a pigment or a polymer-soluble colourant and 90 to 30% by weight of a carrier mixture which is composed of 51 to 95% by weight of a metal salt of an aliphatic carboxylic acid containing at least 12 carbon atoms, said metal selected from the group consisting of calcium, barium, zinc, aluminum, and magnesium, and 49 to 5% by weight of an elastomeric or thermoplastic polymer selected from the group consisting of a copolymer of ethylene and vinyl esters of aliphatic carboxylic acids of 2 to 6 carbon atoms, homo- or copolymers of ethylene, propylene, butylene, styrene, acrylonitrile, butadiene and polyamide.

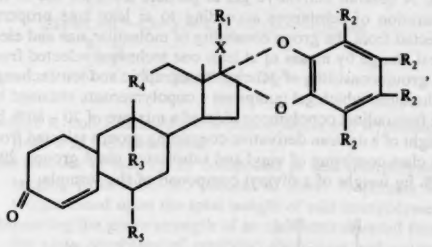
4,094,840

17-ALKYLTHIO (AND ARYLTHIO) ANDROSTENO[16α,17α-b]BENZODIOXIN-3-ONES

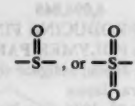
Ravi K. Varma, Belle Mead, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 12, 1977, Ser. No. 796,293
Int. Cl.[2] C07J *73/00*
U.S. Cl. 260—239.55 R **22 Claims**

1. A steroid having the formula



or the 1,2-dehydro derivative thereof, wherein X is —S—,



R_1 is alkyl, aryl or acyloxyalkyl; R_2 is fluoro, chloro, bromo, or iodo; R_3 is hydrogen, fluoro, chloro, bromo or iodo; R_4 is carbonyl, β-hydroxymethylene or β-acyloxymethylene; and R_5 is hydrogen or fluoro; wherein the term "aryl" is phenyl or phenyl substituted with 1 or 2 alkyl, alkoxy, fluoro, chloro, bromo or iodo groups; the terms "alkyl" and "alkoxy" refer to groups having 1 to 10 carbon atoms; and the term "acyloxy" refers to groups of the formula

wherein Y is alkyl or aryl.

4,094,841

HIGHLY MONODISPERSE LATEXES OF NON-FILM FORMING POLYMERS

Inder Mani, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 17, 1974, Ser. No. 479,957
Int. Cl.[2] C08F *220/56*
U.S. Cl. 260—29.6 H **10 Claims**

1. A highly monodisperse latex of a water-insoluble copolymer of an emulsion polymerizable α,β-ethylenically unsaturated hard monomer and at least about one weight percent of an emulsion polymerizable α,β-ethylenically unsaturated amide selected from the group consisting of acrylamide, methacrylamide, fumaric amide, maleic amide, itaconic amide, and citraconic amide; said copolymer being in the form of non-film forming discrete particles having an average particle diameter in the colloidal range with a standard particle size deviation less than 2 percent.

4,094,842

DISPERSING SOLID POLYURETHANE PREPOLYMERS INTO WATER

Wolfgang Wenzel, and Dieter Dieterich, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 27, 1976, Ser. No. 727,088
Claims priority, application Germany, Sep. 26, 1975, 2543091
Int. Cl.[2] C08J *3/04*; C08G *18/12*; C08J *3/24*; C08G *18/82*
U.S. Cl. 260—29.2 TN **9 Claims**

1. A process for the production of polyurethane films and coatings from oligomeric polyurethane prepolymers which are free from isocyanate groups and cross-linking agents comprising:

(a) contacting solid oligomeric polyurethane prepolymers which are free from isocyanate groups in the form of lumps or coarse powders with water at a temperature below the softening point of the prepolymer to form a dispersion, said oligomeric polyurethane prepolymers characterized in that

(1) they have an average molecular weight of less than about 20,000,

(2) they contain at least about 4 to 120 milliequivalents of ionic groups per 100 grams of prepolymer, said milliequivalents of ionic groups derived from groups selected from the group consisting of ionic groups and groups capable of conversion into ionic groups before, during or after said prepolymers are brought into contact with water, or at least about 2 to 20% by weight of hydrophilic units of the formula $-CH_2-CH_2-O-$, and

(3) they are solid at room temperature,

(b) applying the dispersion to a substrate,

(c) cross-linking the oligomeric polyurethane prepolymer by the addition of a cross-linking agent to the dispersion, said addition being before, during or after the application of the dispersion to said substrate and,

(d) drying said dispersion.

4,094,843

AQUEOUS COATING COMPOSITION AND PROCESS FROM A MERCAPTAN CONTAINING POLYMER AND A BIS-MALEIMIDE

Vincent Daniel McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 708,106, Jul. 23, 1976, Pat. No. 4,035,272, which is a continuation-in-part of Ser. No. 595,448, Jul. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,409, Oct. 31, 1974, Pat. No. 3,925,181. This application Mar. 28, 1977, Ser. No. 781,549
Int. Cl.[2] C08J *3/00*
U.S. Cl. 260—29.2 N **12 Claims**

1. A coating composition in aqueous dispersion for forming a curable film thereof, comprising:

a water-dispersed polymer having at least about 5% by weight pendant mercaptan groups; and

at least about 5% by weight of said polymer of bis-maleimide cross-linking agent;

said bis-maleimide having alpha-, beta-ethylenic unsaturation for cross-linking said polymer through said mercaptan groups by addition polymerization upon subsequent curing of said curable film.

4,094,844

WATER-BORNE EPOXY RESIN COATING COMPOSITIONS

Roy A. Allen, and Leroy W. Scott, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 28, 1977, Ser. No. 782,208
Int. Cl.[2] C08L *61/06, 63/00*
U.S. Cl. 260—29.3 **9 Claims**

1. A hydrolytically-stable, heat-curable composition comprising:

(1) a water-soluble composition prepared by (a) condensing a chemical excess of a lower molecular weight epoxy resin with an amino-substituted benzoic acid, (b) reacting the terminal epoxide groups of the resulting condensate with a secondary amine and then (c) solubilizing the product of (b) by neutralizing the carboxyl groups with a tertiary amine or ammonia, and

(2) a curing amount of a water-miscible aminoplast or phenolplast resin.

4,094,845

METHOD OF REDUCING LOSS OF WATER BY TRANSPIRATION AND COMPOSITION THEREFOR

Charles F. De Long, Washington, D.C., assignor to United States Trading International, Inc., Washington, D.C.

Filed Sep. 19, 1975, Ser. No. 614,925
Int. Cl.[2] C08L *61/28, 63/00, 33/08*
U.S. Cl. 260—29.4 UA **12 Claims**

1. Composition for decreasing the loss of water from leaves and stems of plants by transpiration and for protecting plants from damage by wind and cold consisting essentially of an aqueous solution or dispersion of a carboxylated hydrophilic acrylic polymer, a cross-linking agent for the carboxylated hydrophilic acrylic polymer and an effective amount of an ultraviolet-absorbing agent, wherein the carboxylated hydrophilic acrylic polymer and the cross-linking agent together comprise from about 3% to about 30% by weight of the aqueous solution or dispersion, said carboxylated hydrophilic acrylic polymer is a copolymer containing monomer units from at least one C_1-C_4 alkyl acrylate or methacrylate and from about 5% to about 20% by weight of at least one carboxylic monomer, and the amount of cross-linking agent is about 1% to

about 20% by weight of solids of said carboxylated hydrophilic acrylic polymer.

4,094,846

LOW PRESSURE MELAMINE RESINS CONTAINING ELASTOMERS

Darwin Fiske DeLapp, New Canaan, Conn., assignor to Formica Corporation, Cincinnati, Ohio

Filed Feb. 11, 1977, Ser. No. 767,720
Int. Cl.[2] C08L *61/28*
U.S. Cl. 260—29.4 R 10 Claims

1. A composition of matter comprising a mixture of

(1) an aqueous melamine/formaldehyde resin solution wherein the melamine to formaldehyde ratio thereof ranges from about 1:1.6 to about 1:2.5,

(2) from about 2.5% to about 30.0%, by weight, based on the weight of the resin solids of (1), of an elastomer comprising

(a) an ethylene vinyl chloride copolymer containing from about 20% to about 30% ethylene, from about 65% to about 80% vinyl chloride and from about 0.5% to about 7.0%, by weight, said percentages being based on the total weight of (a), of amide groups,

(b) a polyurethane resin containing from about 3.0% to about 10.0%, by weight, based on the total weight of (b), of carboxyl groups, or

(c) a butadiene/acrylonitrile polymer containing from about 50% to about 95% butadiene, from about 5% to about 50% acrylonitrile and from about 1% to about 10%, by weight, said percentages being based on the total weight of (c), of carboxyl groups, said elastomer having a particle size of up to about 20,000 Angstroms, and

(3) from about 0.25 to about 1.25%, by weight, based on the total weight of solids in said composition, of an alkylene polyamine having the formula

$$H_2N[CH_2CH_2NH]_nCH_2CH_2NH_2$$

wherein *n* is a whole, positive integer of 0–3, inclusive.

4,094,847

ELASTOMER MODIFIED MELAMINE RESINS

Kenneth Robert Huffman, Stamford; Donald James Casey, Ridgefield, and Walter Moreland Thomas, Darien, all of Conn., assignors to Formica Corporation, Cincinnati, Ohio

Filed Feb. 11, 1977, Ser. No. 767,721
Int. Cl.[2] C08L *61/28*
U.S. Cl. 260—29.4 R 11 Claims

1. A composition of matter comprising a mixture of

1. an aqueous melamine/formaldehyde resin solution and,

2. from about 2.5% to about 30.0%, by weight, based on the weight of the resin solids of (1), of an elastomer comprising

a. an ethylene/vinyl chloride copolymer containing from about 0.5% to about 7.0%, by weight, based on the total weight of (a), of amide groups or

b. a polyurethane resin containing from about 3.0% to about 10.0%, by weight, based on the total weight of (b), of carboxyl groups,

said elastomer having a particle size of up to about 20,000 Angstroms.

4,094,848

PROCESS FOR PRODUCING FINELY DIVIDED POROUS POLYMER PARTICLES

Kenji Naito, Odawara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 20, 1976, Ser. No. 688,191
Claims priority, application Japan, May 20, 1975, 50-59925
Int. Cl.[2] C08L *33/04*
U.S. Cl. 260—29.6 E 12 Claims

1. A process for producing finely divided porous polymer particles comprising:

(1) forming a solution by dissolving a copolymer in a solvent mixture

(a) said copolymer comprising as one comonomer component of said copolymer, from about 10 to about 70 mol % of a vinyl compound which contains a carboxyl group,

(b) said solvent mixture comprising

(i) from about 20 to about 90% by weight of a solvent selected from the group consisting of sec-butanol, tert-butanol or mixtures thereof, and

(ii) from about 10 to about 80% by weight of a hydrophobic organic solvent,

(2) forming a water drop containing polymer emulsion by dispersing said solution in an aqueous medium in the presence of at least one emulsion stabilizer or surface active agent, and

(3) recovering said finely divided porous polymer particles from said emulsion.

4,094,849

PROCESS FOR PRODUCING AQUEOUS DISPERSION OF ETHYLENE-VINYL ACETATE COPOLYMER CONTAINING NO FORMALIN

Takeo Oyamada; Kazuhisa Satoh; Shinobu Tsuru, all of Ichihara; Masahiro Domoto, Toyonaka, and Shizuo Narisawa, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Oct. 27, 1976, Ser. No. 736,100
Claims priority, application Japan, Nov. 4, 1975, 50-132694
Int. Cl.[2] C08L *31/00*
U.S. Cl. 260—29.6 MQ 7 Claims

1. A process for producing an aqueous dispersion of an ethylene-vinyl acetate copolymer containing no formalin by emulsion-polymerization ethylene and vinyl acetate and optionally other copolymerizable vinyl monomers in the presence of a redox catalyst consisting of an oxidizing agent and a reducing agent, which is characterized in that a reaction product of a glyoxal compound and an alkali metal, ammonium or zinc salt of a reductive sulfur oxide is used as the reducing agent for the redox catalyst.

4,094,850

FLAME RETARDANT COMPOSITION

Albert W. Morgan, Collinsville, Ill.; David S. Moorman, Houston, Tex., and William Vanderlinde, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

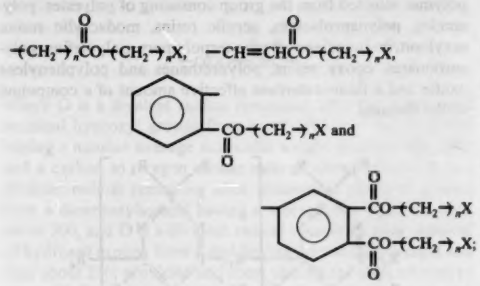
Continuation-in-part of Ser. No. 619,722, Oct. 6, 1975, abandoned, which is a continuation of Ser. No. 232,189, Mar. 6, 1972, abandoned. This application Jul. 6, 1976, Ser. No. 702,802
Int. Cl.[2] C08K *5/11, 5/12*
U.S. Cl. 260—31.8 PQ 36 Claims

1. A composition consisting essentially of a polyolefin, said polyolefin having incorporated the resin a plasticizing amount of a compound of the formula

$$RCO\text{-}(CH_2)_nX$$

wherein

R represents alkyl,



X represents halogen; and
n represents the integer 4 or 5.

4,094,851

METHOD OF PREPARATION OF CLEAR CONCENTRATE COMPOSITIONS

Richard T. Haynes, Kirkwood, and Harry L. Young, Rock Hill, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 407,372, Oct. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 274,156, Jul. 24, 1972, abandoned, which is a continuation of Ser. No. 770,088, Oct. 23, 1978, abandoned. This application Jun. 3, 1975, Ser. No. 583,327

Int. Cl.[2] C08K *5/01*; D06P *1/00*

U.S. Cl. 260—33.6 UA **11 Claims**

1. In a method for preparing a clear concentrate composition useful in forming a clear vehicle for cutting color concentrates wherein a bonding agent, a wetting agent, an organic solvent in 5 percent to 50 percent by weight of said composition, and a thickening agent are admixed to form said clear concentrate composition, said thickening agent comprising a C_2–C_4 olefin-maleic anhydride interpolymer cross-linked with a cross-linking agent selected from the group consisting of a vinyl ester of an olefinically unsaturated carboxylic acid having from 3 to 24 carbon atoms and about 0.35 to about 0.55 mol percent of triallyl isocyanurated based upon the maleic anhydride monomer, the improvement which comprises neutralizing said clear concentrate composition, prior to further dilution, to a pH greater than 7, as measured by a 1% aqueous dispersion of said clear concentrate composition, with an organic amine selected from the group consisting of acyclic primary monoamines and heterocyclic monoamines, said organic amines having a boiling point less than 100° C.

4,094,852

PROCESS FOR THE PRODUCTION OF POLYTRIAZINES IN THE PRESENCE OF HIGH-BOILING ESTERS

Rudolf Sundermann, New Martinsville, W. Va.; Günther Rottloff, Cologne, Germany; Ernst Grigat, Odenthal-Gloebusch, Germany, and Rolf Putter, Dusseldorf, Germany, assignors to Bayer Aktiengesellschaft, Germany

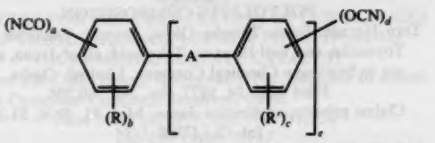
Filed Jul. 22, 1976, Ser. No. 707,546

Claims priority, application Germany, Jul. 24, 1975, 2533124

Int. Cl.[2] C08G *73/06*

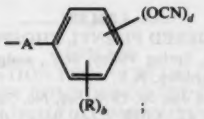
U.S. Cl. 260—37 N **7 Claims**

1. A polytrimerizable mixture of 30 to 99.9% by weight of at least one aromatic cyanic acid ester of the formula

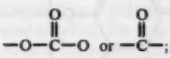


wherein

R is hydrogen, halogen, alkyl having 1 to 9 carbon atoms, phenyl, alkoxy having 1 to 4 carbon atoms or alkoxy carbonyl having 1 to 4 carbon atoms in the alkyl moiety, or two R substituents together on adjacent carbon atoms of the phenyl moiety to which they are attached together form a hydrocarbon ring containing from 5 to 6 carbon atoms or together form with O, S or N a 5 or 6-membered heterocyclic ring; R′ has the same meaning as R or is the group



A is a bond, alkylene having 1 to 9 carbon atoms or said alkylene substituted by phenyl or alkyl having 1 to 4 carbon atoms, a divalent cycloaliphatic or aromatic 5 or 6-membered ring or said divalent ring including oxygen as a hetero atom, oxygen, $-SO_2-$,



a is 0 to 5 when *e* is 1 and 2,5 when *e* is 1;
b is 5 – *a* when *e* is 1 and 6 – *a* – *d* when *e* is 0;
c is 5 – *d*;
d is 0 to 5; and
e is 0 to 3
with the proviso that the sum of $a + d$ is always from 2 to 5.

or a partially cross-linked prepolymer of said cyanic ester of said formula which is soluble in organic solvents and 0.1 to 70% by weight of at least one high boiling ester plasticizer having a boiling point above 250° C at 760 Torr.

4,094,853

ALKOXY TITANATE SALTS USEFUL AS COUPLING AGENTS

Salvatore J. Monte, Staten Island, N.Y., and Gerald Sugerman, Allendale, N.J., assignors to Kenrich Petrochemicals, Inc., Hudson, N.J.

Filed May 15, 1975, Ser. No. 577,922

Int. Cl.[2] C08K *9/04*

U.S. Cl. 260—40 R **8 Claims**

1. A filled polymeric composition which comprises a peroxide-cured polymer containing therein a filler treated with a compound having the formula $(RO)Ti(OCOR')_3$ wherein R is a monovalent alkyl, alkenyl, alkynyl, or aralkyl group having from 1 to 30 carbon atoms or a substituted derivative thereof and R′ is a monovalent organic group, the total number of carbon atoms in the three R′ groups in a molecule being not more than 14.

4,094,854
POLYOLEFIN COMPOSITION

Taro Harada, Suita; Taisuke Okita, Ibaraki; Takahisa Hara, Toyonaka, and Yuji Ikezawa, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 24, 1977, Ser. No. 780,705
Claims priority, application Japan, Mar. 31, 1976, 51-36539
Int. Cl.² C08K *3/34*
U.S. Cl. 260—42.46 **6 Claims**

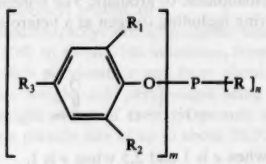
1. A polyolefin composition comprising (I) a crystalline polyolefin and (II) 5 to 45% by weight of a mixture of inorganic fillers based on the total weight of said polyolefin and said inorganic filler mixture, said mixture comprising (1) 40 to 95% of a powder mixture consisting essentially of calcium metasilicate and 0.2 to 20% by weight of calcium carbonate, said powder being in the long and narrow shape and more than 98% by weight thereof being passable through a 200-mesh Tyler's standard sieve and (2) 60 to 5% by weight of hydrated magnesium silicate powder which is passable through a 325-mesh Tyler's standard sieve.

4,094,855
HINDERED PHENYL PHOSPHITES

John D. Spivack, Spring Valley, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 30, 1976, Ser. No. 710,063
Int. Cl.² C07F *9/145, 9/146, 9/206*
U.S. Cl. 260—45.8 NT **20 Claims**

1. A compound of the formula



wherein R_1 and R_2 are independently lower alkyl or hydrogen, provided that only one of R_1 and R_2 is hydrogen,

R_3 is $-(A)_q-COOR_4$

where

A is alkylene of 1 to 6 carbon atoms,

R_4 is alkyl of 1 to 24 carbon atoms, phenyl or alkyl substituted phenyl,

q is 0 or 1,

m and n are each 1 or 2, the values of m and n being such that the trivalent state of P is satisfied,

R is

(a) halogen,

(b) hydroxyl, provided that m is 2 and n is 1 when R is hydroxyl, or

(c) $-XR_5$ wherein X is S or O and R_5 is alkyl of 1 to 24 carbon atoms, phenyl, alkyl susbstituted phenyl.

15. A composition of matter comprising an organic polymeric synthetic material normally subject to thermal, oxidative and ultraviolet degradation stabilized with

(a) 0.005% to 5% of a stabilizing compound according to claim 1,

(b) 0 to 5% of a phenolic antioxidant,

(c) 0 to 5% of a thio co-stabilizer,

(d) 0 to 5% of a UV absorber, and

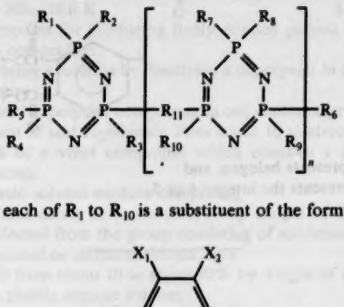
(e) 0 to 5% of a light stabilizer.

4,094,856
FLAME RETARDANT POLYMERIC COMPOSITIONS

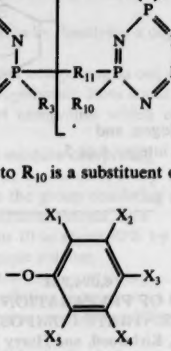
Randolph Joseph Guschl, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 15, 1976, Ser. No. 696,278
Int. Cl.² C08K *5/16*
U.S. Cl. 260—45.9 NP **15 Claims**

1. A flame retardant polymeric composition comprising a polymer selected from the group consisting of polyester, polyamides, polycaprolactam, acrylic resins, modacrylic resins, acrylonitrile-butadiene-styrene terpolymers, polyolefins, polycarbonates, epoxy resins, polyurethanes and polyphenylene oxides and a flame-retardant effective amount of a compound of the formula



wherein each of R_1 to R_{10} is a substituent of the formula



where

X_1 to X_5 is hydrogen, bromine and chlorine,

R_{11} is a linking group derived from bisphenol A, resorcinol, hydroquinone, bisphenol S and p,p'-dihydroxybiphenyl, and

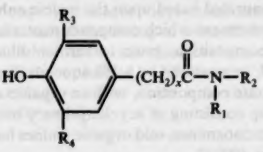
n is a number from 1 to 10.

4,094,857
COPOLYMERIZABLE PHENOLIC ANTIOXIDANT

James Richard Wolfe, Jr., Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

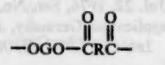
Filed Sep. 1, 1977, Ser. No. 829,822
Int. Cl.² C08K *5/20;* C07D *307/89, 307/93;* C07C *101/42*
U.S. Cl. 260—45.9 QB **29 Claims**

1. An antioxidant having the structural formula:

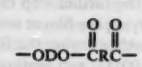


where R_1 is hydrogen or a lower alkyl radical; R_2 is a monovalent radical containing carbon, hydrogen, and oxygen, free of ethylenic or acetylenic unsaturation, and having a molecular weight between about 99–300 and, further, containing two carboxyl groups or their ester-forming equivalents; R_3 and R_4 are tertiary alkyl radicals each containing not more than 8 carbon atoms; and x is an integer of from 0–4.

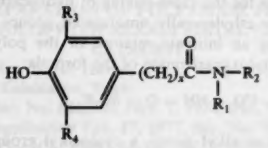
10. In a stabilized copolyetherester composition consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head-to-tail through ester linkages, said long chain ester units being represented by the formula



and said short chain ester units being represented by the formula



where G is a divalent radical remaining after the removal of terminal hydroxyl groups from a poly(alkylene oxide) glycol having a number average molecular weight of about 400–6000 and a carbon to oxygen atomic ratio of about 2.0–4.3; R is a divalent radical remaining after removal of carboxyl groups from a dicarboxylic acid having a molecular weight less than about 300, and D is a divalent radical remaining after removal of hydroxyl groups from a diol having a molecular weight less than about 250; provided said short chain ester units amount to about 15–95 percent by weight of said copolyetherester and characterized in that said copolyetherester is stabilized against oxidative degradation due to the presence in the backbone of the copolyetherester of an effective concentration of antioxidant units derived from:



where R_1 is hydrogen or a lower alkyl radical; R_2 is a monovalent radical containing carbon, hydrogen, and oxygen, free of ethylenic or acetylenic unsaturation, and having a molecular weight between about 99–300 and, further, containing two carboxyl groups or their ester-forming equivalents; R_3 and R_4 are tertiary alkyl radicals each containing not more than 8 carbon atoms; and x is an integer of from 0–4, said antioxidant units being connected to ester units in the copolyetherester through ester linkages.

4,094,858

FLAME RETARDANT PLASTIC COMPOSITIONS

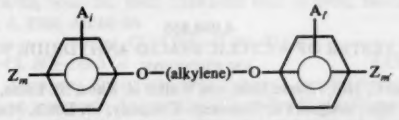
Arnold L. Anderson, Antioch, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 330,806, Feb. 8, 1973, Pat. No. 4,049,624. This application Jul. 25, 1977, Ser. No. 818,373

Int. Cl.² C08K *5/06*

U.S. Cl. 260—45.75 B **16 Claims**

1. A plastic composition containg polystyrene having incorporated therein (1) an effective amount of a flame retardant which is a bis-phenoxy compound having the formula:



wherein Z is bromine; m is an integer having a value of 1–5 and m' is an integer having a value of 0–4; i is an integer having a value of 0–2 and i' is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine; and (2) an enhancing agent which is antimony, arsenic, bismuth, tin or zinc-containing compound.

4,094,859

PROCESS FOR THE PREPARATION OF COPOLYMERS OF THIODIETHANOL USING A PHOSPHOROUS ACID-METAL SULFATE CATALYST

Eugene Yue Chieh Chang, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 18, 1977, Ser. No. 779,114

Int. Cl.² C08G *75/12*

U.S. Cl. 260—47 R **7 Claims**

1. A process for the preparation of a linear, high molecular weight elastomeric polymer of thiodiethanol which comprises condensing a monomer charge comprising thiodiethanol or a major proportion of thiodiethanol with (A) one or more saturated or unsaturated aliphatic diols, or (B) one or more dihydric phenolic compounds, or (C) mixtures of (A) and (B), at a temperature in the range of about 150° to 200° C, under conditions whereby water formed in the reaction is removed and in the presence of a catalyst comprising from about 0.01 to 3 percent by weight of phosphorous acid and from about 0.01 to 3 percent by weight of manganese, iron, cobalt, nickel, copper or zinc sulfate.

4,094,860

CONDENSATION PRODUCTS OF AROMATIC POLYHYDROXY COMPOUNDS AND POLYAMINO ALIPHATIC COMPOUNDS

Joseph Kestutis Valaitis, University Heights, and Harold James Harwood, Stow, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 371,636, Jun. 20, 1973, abandoned. This application Mar. 13, 1975, Ser. No. 558,038

Int. Cl.² C08G *73/00, 73/02*

U.S. Cl. 260—47 R **9 Claims**

1. The method of producing a polymer of (1) an aromatic polyhydroxy compound in which the ring portion of the compound is unsubstituted or alkyl-substituted and (2) an aliphatic polyamine of the class consisting of (a) aliphatic polyamines in which the hydrocarbon contains 2 to 60 carbon atoms and (b) polyamines of the formula H_2N-alkylene-X-alkylene-NH_2 in which X is oxygen, sulfur or an arylene or amino group, and the alkyl groups contain 2 to 20 carbon atoms, which comprises heating substantially equimolar amounts of the reactants in the presence of a condensation catalyst and thereby obtaining a polymer by condensation of amine groups with hydroxy groups.

4,094,861

PROCESS FOR THE PRODUCTION OF NON-INFLAMMABLE POLYTRIAZINES

Rudolf Sundermann, New Martinsville, W. Va.; Günther Rottloff, Cologne, Germany; Ernst Grigat, Odenthal-Gloebusch, Germany, and Rolf Pütter, Dusseldorf, Germany, assignors to Bayer Aktiengesellschaft, Germany

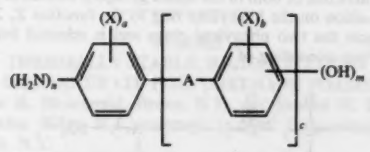
Filed Jul. 22, 1976, Ser. No. 707,545

Claims priority, application Germany, Jul. 24, 1975, 2533122

Int. Cl.² C08G *73/06*

U.S. Cl. 260—47 P **10 Claims**

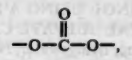
1. A process for producing a polytriazine which comprises reacting more than 0.5 mol and less than 3 mols of a compound of the formula



wherein:

each X is hydrogen, halogen, alkyl having 1 to 9 carbon atoms or phenyl;

A is —O—, —SO_2—,—CO—,



alkylene having 1 to 9 carbon atoms or said alkylene substituted by phenyl or alkyl having 1 to 4 carbon atoms, or a direct bond;
n is 1, 2 or 3;
m is 1, 2 or 3;
c is 0 or 1;
a is 5-*n* where *c* is 1 and 6-*m*-*n* where *c* is 0; and
b is 5-*m*

is condensed with 1 mol of a phosphorus compound selected from the group consisting of phosphorus trihalide and phosphorus oxytrihalide in the presence of a base selected from the group consisting of alkali metal hydroxides, alkali metal carbonates, alkaline earth metal carbonates and tertiary amines in an amount of up to 3.2 mols of base per mol of said phosphorus compound and at a temperature of from −40° to 250° C, thereafter reacting the resulting compound with 1 to 1.1 mol of cyanogen halide in the presence of 1 mol of an inorganic base or a tertiary amine for every primary amino or every phenolic hydroxyl group and at a temperature of −40° to 65° C, and polytrimerizing the latter reaction product at a temperature of from 50° to 350° C to form polytriazine product.

4,094,862

PROCESS FOR PREPARING THERMOPLASTIC AROMATIC POLYIMIDES

Vernon L. Bell, Seaford, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

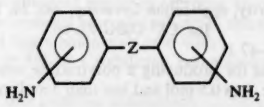
Continuation-in-part of Ser. No. 448,321, Mar. 5, 1974, abandoned. This application Mar. 28, 1975, Ser. No. 562,992
Int. Cl.² C08G *73/10*
U.S. Cl. 260—65 **6 Claims**

1. A method for preparing insoluble thermoplastic aromatic polyimide film having uniquely low softening temperatures by reacting, in a suitable inert solvent,

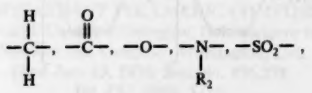
(a) an aromatic dianhydride with the structural formula

where R is an aromatic tetravalent radical, with

(b) a diamine of the structural formula



where one or both of the amine groups is located in a meta position on the phenylene ring to the function Z, Z connects the two phenylene rings and is selected from the group consisting of



R_2 being selected from the alkyl and aryl group, wherein the diamine-dianhydride reaction produces a viscous polymer solution and including the further step of making a film from this viscous solution, drying the film at ambient room temperatures for 4–16 hours, further drying the film in an air circulating oven for 1 hour at 100° C., and heating and maintaining the film to the temperature and range of 200° – 225° C. for at least 2 hours to effect imidization of the polymer film.

4,094,863

CROSS-LINKING HYDROCARBON UNSATURATED POLYMER WITH MONO-SULPHONYLOXYCARBAMATE COMPOUNDS

John Langshaw Brooks, and Richard Budziarek, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 22, 1977, Ser. No. 770,569
Claims priority, application United Kingdom, Feb. 27, 1976, 7809/76
Int. Cl.² C08F *18/24;* C08G *18/00;* C08C *19/20*
U.S. Cl. 260—77.5 B **4 Claims**

1. A process for the cross-linking of hydrocarbon polymers which contain ethylenically unsaturated groups which comprises forming an intimate mixture of the polymer with a mono-sulphonyloxycarbamate of the formula:

$$A - O - CO - NH - O - SO_2R \quad (1)$$

wherein A is an alkyl group, a cycloalkyl group, an alkenyl group, a substituted alkyl group, a substituted aryl group or a heterocyclic group, and R is an optionally substituted alkyl or aryl group and heating the mixture at a temperature within the range 50° to 250° C.

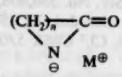
4,094,864

PREPARATION OF POLYAMIDEIMIDE FROM DIISOCYANATE WITH ALKALI METAL LACTAMATE CATALYST

Besir K. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 521,745, Nov. 7, 1974, Pat. No. 4,021,412. This application Feb. 17, 1977, Ser. No. 769,312
Int. Cl.² C08G *18/20, 18/22, 73/14*
U.S. Cl. 260—78 TF **6 Claims**

1. In a process for preparing an essentially linear, solvent soluble solid polyamideimide by the condensation of an organic diisocyanate with a compound containing one carboxylic acid group and one intramolecular anhydride group or the free carboxylic acids thereof in said solvent, the improvement which comprises adding to the solution of polyamideimide forming reactants a catalytic amount of a compound



wherein *n* is an integer from 2 to 5 inclusive, and M is an alkali metal at a temperature of from about 40° C to about 140° C.

4,094,865

POLYESTER OF A CYCLIC DIACID ANHYDRIDE WITH AN EPOXIDE

James C. Hill, Chesterfield, and Walter R. Knox, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1976, Ser. No. 646,215
Int. Cl.² C08G *63/00*
U.S. Cl. 260—78.41 **6 Claims**

1. A polymeric material comprising a polyester produced by a process which comprises:

a. forming a mixture of a cyclic diacid anhydride, a poly-terminal epoxide and a mono-terminal epoxide, the ratio of total epoxy groups to cyclic diacid anhydride groups

being from 1:1 to 2:1 and the epoxy-equivalent mole ratio of polyepoxide to monoepoxide being from 0.01 to 1.0, and adding to said mixture a catalytically effective quaternary salt in an amount that is from 0.0001 to 0.2 mole per mole of anhydride,

b. initiating a non-self-sustaining exothermic reaction between the epoxide and anhydride components of the mixture,

c. raising the temperature of the mixture to a point at which the exothermic reaction becomes self-sustaining and

d. controlling the reaction conditionsduring the self-sustaining exothermic reaction such that the temperature of the reaction mixture is not substantially reduced until after the rate of evolution of heat by the reaction has begun to decrease; the time spent in stages *b* and *c* combined being less than 600 seconds.

4,094,866

PREPARATION OF POLYAMIDE FROM DIISOCYANATE WITH ALKALI METAL LACTAMATE CATALYST

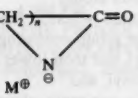
Besir K. Onder, North Haven, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 521,745, Nov. 7, 1974, Pat. No. 4,021,412. This application Feb. 17, 1977, Ser. No. 769,313

Int. Cl.[2] **C08G** *18/20, 18/22, 69/26*

U.S. Cl. 260—78 R **8 Claims**

1. In a process for preparing an essentially linear, solvent soluble solid polyamide by the condensation of an organic diisocyanate with a compound containing two carboxylic acid groups in said solvent, the improvement which comprises preparing said polyamide in the presence of a catalytic amount of a compound



wherein *n* is an integer from 2 to 5 inclusive, and M is an alkali metal at a temperature of from about 40° C to about 140° C.

4,094,867

MANUFACTURE OF POLYSULPHONES

Michael Edward Benet Jones, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

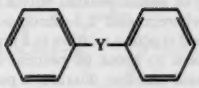
Continuation-in-part of Ser. No. 320,508, Oct. 31, 1963, Pat. No. 4,008,203, and Ser. No. 215,140, Jan. 3, 1972, which is a continuation of Ser. No. 805,025, Mar. 6, 1966, abandoned, which is a continuation-in-part of Ser. No. 320,508, and Ser. No. 474,933, Jul. 26, 1965, abandoned, which is a continuation-in-part of Ser. No. 320,508,. This application May 17, 1976, Ser. No. 687,324

Claims priority, application United Kingdom, Nov. 6, 1962, 41976/62; Mar. 18, 1963, 10592/63; Oct. 3, 1963, 38973/63; Aug. 6, 1964, 32016/64

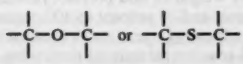
Int. Cl.[2] **C08G** *75/20, 75/23*

U.S. Cl. 260—79.3 M **6 Claims**

1. A process for substantially reducing or eliminating entirely an increase in the viscosity of a molten film or fibre-forming polyaryl sulphone made from a reagent of the formula H-Ar-SO_2.X and/or an equimolar mixture of reagents of the formulae X.SO_2-Ar-SO_2.X and H-Ar-H, in which some of the SO_2 groups may be replaced by -CO- groups where X is a halogen atom and Ar is a divalent aromatic radical obtained by removal of two aromatically bound hydrogen atoms from benzene, a polynuclear hydrocarbon containing no more than 2 aromatic rings, diphenyl, a compound having the structure



where Y is —O—,—S—, —SO—, a divalent hydrocarbon radical a substituted divalent hydrocarbon radical or a residue of a diol containing only carbon atoms or groups of the structure



in the chain between the hydroxyl groups, or substituted derivatives of any such aromatic radicals in which at least one of the aromatically bound hydrogen atoms is substituted by a halogen atom, an alkyl group containing from 1 to 4 carbon atoms or an alkoxy group containing from 1 to 4 carbon atoms and Ar may vary from unit to unit in the polymer chain, which comprises contacting the polymer below the temperature at which such viscosity increase would occur and in the presence of an inert solvent with an organic compound which will inactivate sulphonyl and carbonyl halide groups at temperatures at which the polymer is molten.

4,094,868

AZO DI-ESTER POLYOLS FOR GRAFT COPOLYMERIZATION

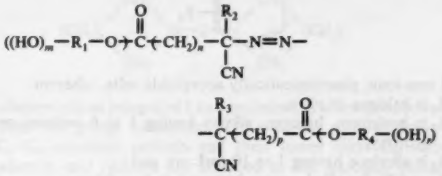
Kiran B. Chandalia, Cheshire, and Frank J. Preston, Meriden, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 22, 1977, Ser. No. 780,213

Int. Cl.[2] **C07C** *107/02;* **C08G** *63/00;* **C08J** *9/00*

U.S. Cl. 260—192 **11 Claims**

1. An azo di-ester polyol characterized by the formula:



I

wherein:

m and *r* independently represent integers from 2 to 5;

n and *p* independently represent integers from 0 to 5;

R_2 and R_3 independently represent alkyl of 1 to 4 carbons; and

$((HO)_m—R_1—O—$ and $—O—R_4—(OH)_r)$ independently represent residues of polyether or polyester polyols, $R_1(OH)_{m+1}$ and $R_4(OH)_{r+1}$, wherein R_1 and R_4 independently represent polyether or polyester chains, having an average equivalent weight of from about 250 to 5000, after removal of one hydroxy hydrogen therefrom.

4,094,869

THERMALLY STABLE, RIGID, CELLULAR ISOCYANURATE POLYURETHANE FOAMS

Jerome B. Biranowski, Bronx, N.Y., and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Jun. 16, 1975, Ser. No. 587,063

Int. Cl.[2] **C08G** *18/14*

U.S. Cl. 260—2.5 AW **25 Claims**

1. A process for preparing a thermally stable, rigid cellular

isocyanurate polyurethane foam that comprises reacting the polyols including an unhalogenated polyol and 2,3-dibromo-2-butenediol-1,4; wherein said 2,3-dibromo-2-butenediol-1,4 is incorporated in said reaction mixture in a proportion by weight of about 30 percent to about 60 percent of the total polyol incorporated in said reaction mixture; a polymethylene polyphenyl polyisocyanate in proportions such that the active hydrogen groups present in the total of the polyols are less than fifty percent of the number of isocyanato groups present in the polymethylene polyphenyl polyisocyanate of said reaction mixture; antimony oxide and hydrated alumina; each of said antimony oxide and said hydrated alumina being present in a proportion by weight of said polyisocyanate of about 1 percent to 20 percent and 10 percent to 100 percent respectively; together with a blowing agent and trimerization catalyst; and subjecting said reaction mixture to postcuring.

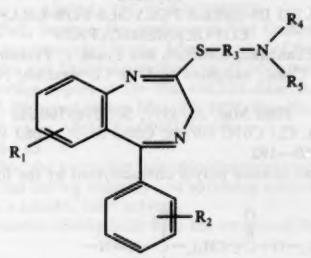
4,094,870

2-SUBSTITUTED THIO-1,4-BENZODIAZEPINE DERIVATIVES

Ikuo Ueda, Yao, and Masaaki Matsuo, Toyonaka, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 559,886, Mar. 19, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,929
Claims priority, application Japan, Mar. 20, 1974, 49-31905
Int. Cl.[2] A61K *31/395;* C07D *243/22*
U.S. Cl. 260—239 BD **21 Claims**

1. A 2-substituted thio-1,4-benzodiazepine compound of the formula



and non-toxic pharmaceutically acceptable salts, wherein
R_1 is halogen or nitro,
R_2 is hydrogen, halogen, alkoxy having 1 to 6 carbons or hydroxy,
R_3 is alkylene having 1 to 10 carbons, and
R_4 and R_5 are alkyl groups having 1 to 6 carbons.

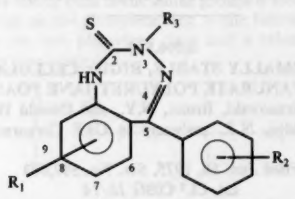
4,094,871

1,3,4-BENZOTRIAZEPINE-2-THIONES

Donald L. Trepanier, and Thomas C. Britton, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Feb. 16, 1977, Ser. No. 769,126
Int. Cl.[2] C07D *255/04, 413/06, 401/06*
U.S. Cl. 260—239.3 B **4 Claims**

1. A compound having the formula



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wherein R_1 and R_2 independently represent hydrogen, lower alkyl, or halo and R_3 represents a lower alkyl or substituted lower alkyl wherein the substitution is selected from the group comprising hydroxy, morpholino, piperidino, dimethylamino, or diethylamino and further including the pharmaceutically-acceptable salts thereof.

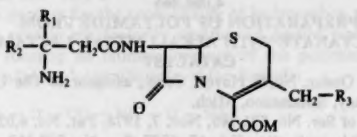
4,094,872

7-(β-AMINOACYLAMINO)-3-HETEROCYCLIC-THIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACID DERIVATIVES

Kunihiko Tanaka, Hattori; Masaru Kurita, Takatsuki, and Osamu Nishiwaki, Sakai, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 12, 1973, Ser. No. 396,580
Claims priority, application Japan, Nov. 17, 1972, 47-115983
Int. Cl.[2] C07D *501/54, 501/56;* A61K *31/545*
U.S. Cl. 544—26 **8 Claims**

1. Compounds of the formula



wherein
R_1 is hydrogen, lower alkyl having one to six carbon atoms, lower alkenyl having two to six carbon atoms, cyclohexyl, phenyl, or thienyl,
R_2 is hydrogen or lower alkyl having one to six carbon atoms, or
R_1 and R_2 taken together with the carbon to which they are attached is a cycloalkyl or cycloalkenyl group having from 5 to 7 carbon atoms,
R_3 is heterocyclicthio wherein the heterocyclic group is selected from the group consisting of 1,3,4-thiadiazolyl or 1,2,4-thiadiazolyl, and their lower alkyl derivatives, lower alkyl-1-H-tetrazolyl, and
M is hydrogen or a non-toxic, pharmaceutically acceptable cation.

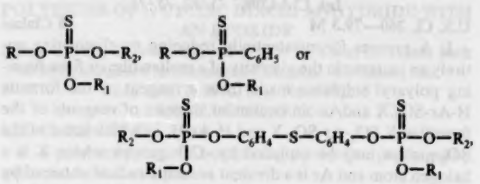
4,094,873

PROCESS FOR PREPARING PHOSPHOROTHIOATES AND PHENYLPHOSPHONOTHIOATES

Lorraine M. Kroposki, Walnut Creek, Calif.; Masao Yoshimine, Midland, Mich., and Harold H. Freedman, Newton Center, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 600,542, Jul. 31, 1975, Pat. No. 4,028,439, which is a division of Ser. No. 354,040, Apr. 24, 1973, Pat. No. 3,917,621, which is a continuation-in-part of Ser. No. 229,171, Feb. 24, 1972, abandoned. This application Jan. 21, 1977, Ser. No. 761,176
Int. Cl.[2] C07F *9/09, 9/165*
U.S. Cl. 544—243 **17 Claims**

1. In the process of preparing a compound corresponding to the formula



wherein:
R_1 and R_2 are each independently

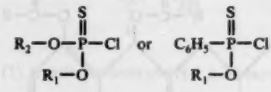
wherein:

n is 0, 1, 2 or 3; and

X is nitro, cyano, halo, lower alkyl, lower alkoxy, lower alkylthio or lower alkylsulfinyl, with the proviso that R does not bear more than one nitro group, lower alkylthio group or lower allkylsulfinyl group; by reacting in an inert liquid reaction medium and under neutral or alkaline conditions (a) a compound corresponding to the formula

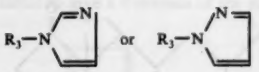
$$R\text{-}O^{\ominus}M^{\oplus} \text{ or } M^{\oplus\ominus}O\text{—}C_6H_4\text{—}S\text{—}C_6H_4\text{—}O^{\ominus}M^{\oplus}$$

with (b) a compound corresponding to the formula



wherein M is an alkali metal and R, R_1 and R_2 have the aforesaid meaning;

the improvement consisting of conducting the process in the presence of a small but catalytic amount of (1) a quaternary ammonium salt having a mininum solubility of at least 1 weight percent in the liquid reaction medium at 25° C and (2) a diazole corresponding to the formula



wherein R_3 is hydrogen or alkyl of 1 to 6 carbon atoms.

4,094,874

PROCESS FOR THE PRODUCTION OF 2-AMINO-4-HYDROXY-6-METHYLPTERIDINE

Enrico Catalucci, Visp, Switzerland, assignor to Lonza, Ltd., Gampel, Switzerland

Filed Jan. 13, 1977, Ser. No. 759,047

Claims priority, application Switzerland, Jan. 13, 1976, 313/76

Int. Cl.[2] C07D *475/04*

U.S. Cl. 544—258 **11 Claims**

1. The process for the production of 2-amino-4-hydroxy-6-methylpteridine from 2,4,5-triamine-6-hydroxypyrimidine and 1,1-dichloroacetone which is characterized in that the 2,4,5-triamino-6-hydroxypyrimidine in the form of one of its stable salts is converted with 1,1-dichloro acetone, such being present in a 1 to 2 times equivalent quantity, in relation to said 2,4,5-triamino-6-hydroxypyrimidine, to 2-amino-4-hydroxy-6-methylpteridine, in a solvent of solvent mixture at a pH value of 3.5 to 4.5 in the presence of sodium bisulfite, from 1.2 mole of said sodium bisulfite per mole of said stable salt of 2,4,5-triamino-6-hydroxypyrimidine at 5 liters of reaction solution up to 3 moles of the sodium bisulfite per mole of said stable salt of 2,4,5-triamino-6-hydroxypyrimidine at 50 liters of reaction solution being used.

4,094,875

3-PYRIDYLMETHYL N-(4-CYANOMETHYLPHENYL)CARBAMATE AND DERIVATIVES

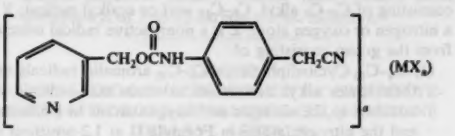
Ernest D. Weiler, Ambler, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 475,709, Jun. 3, 1974, Pat. No. 3,929,810. This application Oct. 3, 1975, Ser. No. 619,277

Int. Cl.[2] C07F *3/06, 3/04, 3/14, 1/10*

U.S. Cl. 260—270 PY **2 Claims**

1. A metal salt complex of the structure



wherein

M is a metal cation of cadmium, calcium, cobaltous, cupric, ferrous, ferric, manganous, mercuric, nickel, silver, stannous or zinc;

X is a bromide, chloride, iodide, perchlorate, carbonate, bicarbonate, nitrate, phosphate, sulfate, bisulfate, acetate, maleate, oxalate, or p-toluene sulfonate anion forming a salt with the cation M in which the salt has sufficient solubility to form a complex with 3-pyridylmethyl N-(4-cyanomethylphenyl)carbamate;

a is an integer corresponding to the valence of cation M; and

n is an integer which for the anion X satisfies the valence of cation M.

4,094,876

CHELATED LITHIUM ALUMINUM COMPOUNDS

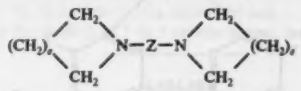
Arthur W. Langer, Jr., Watchung, and Thomas A. Whitney, Roselle, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 344,230, Mar. 23, 1973, Pat. No. 3,933,879, which is a continuation-in-part of Ser. No. 808,328, Mar. 18, 1969, now Pat No. Re. 28,456. This application Oct. 16, 1975, Ser. No. 622,840

Int. Cl.[2] C07D *401/10, 401/06;* C07F *1/02, 5/06*

U.S. Cl. 260—270 PD **7 Claims**

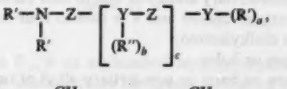
1. A complex comprising: (a) an inorganic lithium salt having a lattice energy less than 210 kilocalories per mole at 18° C and (b) a chelating polyfunctional Lewis base selected from the group consisting of sparteine, N,N'-di-(C_1-C_4 alkyl) bispidins and those compounds having the formula:



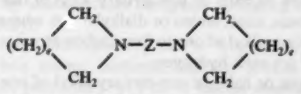
II

wherein *e* is an integer of 0 to 3 inclusive; Z is a radical selected from the group consisting of (1) C_4–C_{10} cycloaliphatic or C_6–C_{10} aromatic radicals and their lower alkyl derivatives wherein said radicals are attached to the nitrogen atoms in Formula II at the 1,2 position on the aromatic rings or 1,2- or 1,3-positions on the cycloaliphatic rings, and (2) 1 to 4 methylenic radicals wherein each methylenic radical contains 0 to 2 monovalent hydrocarbon radicals of 1 to 6 carbon atoms.

7. A chelated mono- or di- lithio aromatic radical anion having the formula Chel•Li^+[Ar] wherein said Chel is a polyfunction Lewis base selected from the group consisting of sparteine, N,N'-di-(C_1-C_4 alkyl) bispidins, tris-(β-C_1-C_4-dialkyl aminoethyl) amine and those compounds having the formulas:



I



II

wherein *a* is 1 or 2, depending on the valence of Y; *b* is 0 or 1, depending on the valence of Y; *c* is an integer of 0 to 4, inclusive; *e* is an integer of 0 to 3, inclusive; R' is the same or differ-

ent C_1–C_4 alkyl radical, R″ is one selected from the group consisting of C_1–C_4 alkyl, C_6–C_{10} aryl or aralkyl radical; Y is a nitrogen or oxygen atom; Z is a nonreactive radical selected from the group consisting of:

(1) C_4–C_{10} Cycloaliphatic or C_6–C_{10} aromatic radicals and their lower alkyl derivatives wherein said radicals are attached to the nitrogen and oxygen atoms in Formula I and the nitrogen atoms in Formula II at 1,2-positions on the aromatic rings or 1,2- or 1,3-positions on the cycloaliphatic rings; and

(2) 1 to 4 methylenic radicals, wherein each methylenic radical contains 0 to 2 monovalent hydrocarbon radicals of 1 to 6 carbon atoms;

and Ar is an aromatic compound whose reduction potential is that of biphenyl or greater.

4,094,877

TRI- OR TETRASUBSTITUTED DIPHENYLPHTHALIDES

Nathan N. Crounse, Cincinnati, and Paul J. Schmidt, Sharonville, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

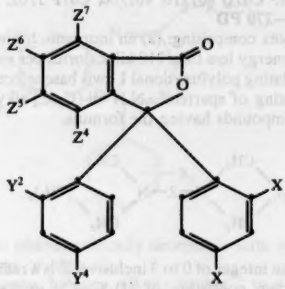
Continuation-in-part of Ser. No. 527,757, Nov. 27, 1974, Pat. No. 4,032,527, which is a continuation-in-part of Ser. No. 314,443, Dec. 12, 1972. This application Nov. 10, 1976, Ser. No. 740,592

Claims priority, application Canada, Dec. 5, 1973, 187401

Int. Cl.² C07D *307/87*

U.S. Cl. 260—293.58 **52 Claims**

1. 3-(2-X-4-X-Phenyl)-3-(2-Y^2-4-Y^4-phenyl)-4-Z^4-5-Z^5-6-Z^6-7-Z^7-phthalide of the formula



wherein:

X is dialkylamino wherein alkyl is non-tertiary alkyl of one to four carbon atoms;

Y^2 is hydrogen, non-tertiary alkyl of one to four carbon atoms, dialkylamino wherein alkyl is non-tertiary alkyl of one to four carbon atoms, alkanoylamino of two to five carbon atoms, non-tertiary alkoxy of one to four carbon atoms or halo;

Y^4 is the same as Y^2 when Y^2 is dialkylamino; or dialkylamino, pyrrolidino, piperidino, alkylbenzylamino, alkyl(4-alkoxyphenyl)amino or alkyl(Q-$(CH_2)_n$-amino, wherein alkyl is non-tertiary alkyl of one to four carbon atoms, alkoxy is non-tertiary alkoxy of one to four carbon atoms, Q is hydroxy or chloro and *n* is two to four when Y^2 is other than dialkylamino;

Z^4 is hydrogen or halo;

Z^5 is hydrogen or halo; or non-tertiary alkyl of one to four carbon atoms, nitro, amino or dialkylamino wherein alkyl is non-tertiary alkyl of one to four carbon atoms when Z^4, Z^6 and Z^7 are each hydrogen;

Z^6 is hydrogen or halo; or non-tertiary alkyl of one to four carbon atoms, nitro, amino or dialkylamino wherein alkyl is non-tertiary alkyl of one to four carbon atoms when Z^4, Z^5 and Z^7 are each hydrogen; and

Z^7 is hydrogen or halo.

4,094,878

CHEMICAL SYNTHESIS OF FLAVIPUCINE

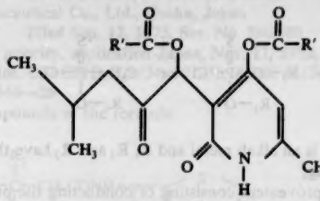
Norman L. Wendler, Summit; Narindar N. Girotra, Fords, both of N.J., and Zbigniew S. Zelawski, deceased, late of Piscataway, N.J. (by Maria W. Zelawski, administrator), assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 705,201, Jul. 14, 1976. This application May 19, 1977, Ser. No. 798,288

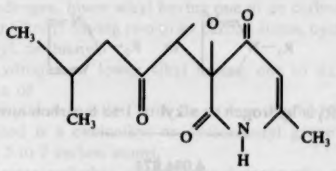
Int. Cl.² C07D *211/40*

U.S. Cl. 260—297 Z **4 Claims**

1. A process for preparing (±) flavipucine and (±) isoflavipucine comprising reacting a diester of the formula:



where R′ is C_1 to C_4 alkyl, phenyl, or C_1 to C_4 alkyl substituted phenyl with at least one equivalent of alkali and a hydroperoxide ROOH where R is H or a C_4 to C_{10} t-alkyl hydroperoxide to form the product



4,094,879

PRODUCTION OF 5-NITROTETRAZOLE SALTS

Leslie Raymond Bates, Cheshunt, and John Michael Jenkins, Sevenoaks, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 1, 1976, Ser. No. 737,692

Claims priority, application United Kingdom, Nov. 11, 1975, 46605/75

Int. Cl.² C07F *3/14, 1/10, 1/08*

U.S. Cl. 260—299 **20 Claims**

1. A method of preparing a silver or mercury 5-nitrotetrazole, which comprises forming an acid solution of a complex of cupric 5-nitrotetrazole with an aliphatic chelating amine, adding to said acid solution at a temperature of at least 50° C, a solution of a soluble silver or mercury salt to precipitate the required 5-nitrotetrazole salt, and filtering off the 5-nitrotetrazole salt.

4,094,880

BIS(CHLOROMETHYLTHIO)THIADIAZOLES

Christian T. Goralski, Midland, and George A. Burk, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 24, 1976, Ser. No. 726,346

Int. Cl.² C07D *285/08, 285/12*

U.S. Cl. 260—302 SD **2 Claims**

1. the compound 2,5-bis(chloromethylthio)-1,3,4-thiadiazole.

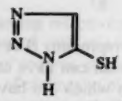
2. The compound 3,5-bis(chloromethylthio)-1,2,4-thiadiazole.

4,094,881
PROCESS FOR PREPARING TRIAZOLETHIOLS

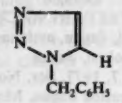
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation of Ser. No. 665,607, Mar. 10, 1976, abandoned. This application Dec. 16, 1976, Ser. No. 751,243
Int. Cl.[2] C07D *249/04*
U.S. Cl. 260—308 A 8 Claims

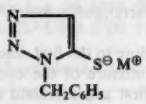
1. A process for preparing 1,2,3-triazole-4(5)-thiol of the formula:



comprising (1) treating 1-benzyl-1H-1,2,3-triazole of the formula



with a base sufficiently strong to generate an anionic charge at the 4-position of said triazole (2) treating the resulting anionic triazole with sulfur to give a 4-thiolate of the formula



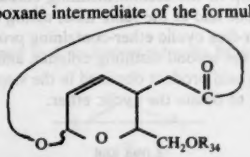
where $M^{\oplus}$ is the cation of said base, (3) removing said benzyl group be reductive means, and (4) acidifying the resulting 4-thiolate with strong acid to give the triazole thiol.

4,094,882
4,5-DIDEHYDRO-6-HYDROXY-2β-ARYLMETHOXYMETHYL-3α-TETRAHYDROPYRANACETIC ACID ε-LACTONES

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,176
Int. Cl.[2] C07D *493/02*
U.S. Cl. 260—343 2 Claims

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,

(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(c) benzhydryl,

(d) benzhydryl substituted by one to ten alkyl of one to four carbom atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 atoms, inclusive,

(e) trityl, and

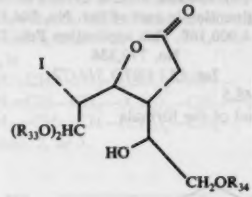
(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,094,883
5-IODO-6-OXO-3-(2′-ARYLMETHOXY-1′-HYDROXYETHYL)-4-HYDROXY-HEXANOIC ACID, γ-LACTONE DIALKYL ACETALS

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,177
Int. Cl.[2] C07D *307/32*
U.S. Cl. 260—343.6 2 Claims

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,

(b) benzyl substituted by 1 to 5 alkyl of 1 to 4 carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(c) benzhydryl,

(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(e) trityl, and

(f) trityl substituted by 1 to 15 alkyl of 1 to 4 carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive; and

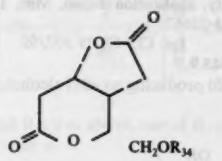
wherein R_{33} is alkyl of 1 to 5 carbon atoms, inclusive.

4,094,884
4α-HYDROXY-6-OXO-2β-ARYLMETHOXY-METHYL-3α-TETRAHYDROPYRANACETIC ACID γ-LACTONES

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,895, Apr. 14, 1976, Pat. No. 4,032,542. This application Apr. 4, 1977, Ser. No. 784,173
Int. Cl.[2] C07D *493/04*
U.S. Cl. 260—343.6 2 Claims

1. A thromboxane intermediate of the formula



wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,

(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(c) benzhydryl,

(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive,

(e) trityl, and

(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

4,094,885

6(6-SUBSTITUTED-2,5,7,8-TETRAMETHYL-2-CHROMANYL)-3-METHYL-4-HEXENOIC ACID DERIVATIVES

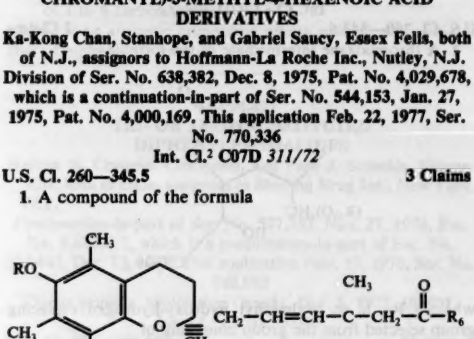
Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 638,382, Dec. 8, 1975, Pat. No. 4,029,678, which is a continuation-in-part of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application Feb. 22, 1977, Ser. No. 770,336

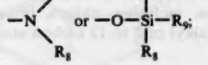
Int. Cl.² C07D *311/72*

U.S. Cl. 260—345.5 **3 Claims**

1. A compound of the formula



wherein R_6 is hydrogen, hydroxy, lower alkoxy,



R_7, R_8 and R_9 are lower alkyl and R is lower alkanoyl, benzyl, benzhydryl or trityl.

4,094,886

PROCESS FOR PRODUCING ALLYL ALCOHOL DERIVATIVES USEFUL IN PROSTAGLANDIN SYNTHESIS

Kiyosi Kondo, Yamato, and Daiei Tunemoto, Sagamihara, both of Japan, assignors to (Zaidanhojin) Sagami Chemical Research Center, Tokyo, Japan

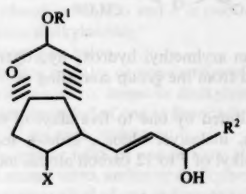
Filed Feb. 9, 1977, Ser. No. 767,165

Claims priority, application Japan, Mar. 1, 1976, 51-21161; Mar. 4, 1976, 51-22667

Int. Cl.² C07D *307/93*

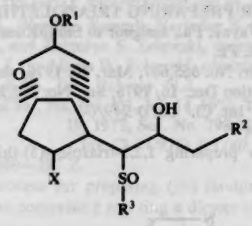
U.S. Cl. 260—345.9 P **3 Claims**

1. A process fo producing an allyl alcohol derivative having the formula



(XI),

which comprises treating a β-hydroxysulfoxide derivative having the formula



(X),

with a base; wherein R^1 represents H or lower alkyl, R^2 represents an alkyl group which can have an inert substituent, R^3 represents an aryl group which can have an inert substituent, and X represents H, OH, alkoxy, tetrahydropyranyloxy, or a silyloxy group.

4,094,887

PROCESS FOR PREPARING CYCLIC ETHERS

Yasuo Tanabe, Kurashiki, Japan, assignor to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Mar. 7, 1977, Ser. No. 774,899

Claims priority, application Japan, Mar. 16, 1976, 51-28453

Int. Cl.² C07D *307/08*

U.S. Cl. 260—346.11 **10 Claims**

1. A process for preparing a cyclic ether by interacting an acetic acid ester of 1,4-butanediol or 1,4-dihydroxybutene-2 and water in the presence of a non-volatile liquid acid catalyst in two reaction zones arranged in series, which process comprises the steps of:

(a) continuously feeding to the first reaction zone said acetic acid ester and a mixture of the cyclic ether and water recycled from a first and a second distilling columns to effect the catalytic reaction,

(b) withdrawing a mixed gas composed of a produced cyclic ether, water and acetic acid from the first reaction zone and feeding said mixed gas to the second distilling column,

(c) feeding the solution discharged from the first reaction zone and fresh water to the second reaction zone for further catalytic reaction and withdrawing the resulting mixed gas composed of the cyclic ether, water and acetic acid from said second reaction zone,

(d) feeding for distillation the mixed gas discharged from the second reaction zone to the first distilling column and recycling a mixture of the cyclic ether and water distilled from the column top to the first reaction zone while discharging acetic acid as a bottom product,

(e) feeding a mixture of the cyclic ether and water distilled from the top of the second distilling column to the first reaction zone and at the same time, taking out a substantially water-free cyclic ether-containing product from the bottom of the second distilling column, and

(f) subjecting said product obtained in the step (e) to further distillation to obtain the cyclic ether.

4,094,888

MALEIC ANHYDRIDE PROCESS

Alan E. Straus, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 23, 1975, Ser. No. 580,443

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.75 **6 Claims**

1. A process for the catalytic production of maleic anhydride from n-butane with sustained high activity for the catalyst which comprises contacting the n-butane feed with oxygen gas and a catalyst comprising oxides of vanadium and phosphorus and maintaining between 3 and 50 mole percent propane in the feed, based on propane plus n-butane, during the normal on-stream time.

4,094,889
RESTORING SELECTIVITY OF ALKALI METAL PROMOTED SILVER CATALYSTS AND PRODUCTION OF OLEFINE OXIDES

Percy Hayden, and Richard William Clayton, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 25, 1977, Ser. No. 772,280

Claims priority, application United Kingdom, Mar. 5, 1976, 8897/76

Int. Cl.[2] C07D *301/10;* B01J *23/96*

U.S. Cl. 260—348.34 11 Claims

1. A process of restoring selectivity to unstable silver containing catalysts promoted with an alkali metal selected from the group consisting of sodium, potassium, rubidium and cesium for the oxidation of olefines to olefine oxides which have lost selectivity in that reaction, which comprises wetting the catalyst with water and drying it.

10. A process which comprises producing an olefine oxide by contacting an olefine with oxygen in the presence of an unstable silver containing catalyst promoted with an alkali metal selected from the group consisting of sodium, potassium, rubidium and cesium in which the selectivity of the catalyst is restored by wetting the catalyst with water and drying it.

4,094,890
9β,10α-CHOLESTA-5,7-DIENE-3β,25-DIOL

William G. Salmond, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 551,698, Feb. 21, 1975, Pat. No. 4,001,096. This application Aug. 26, 1976, Ser. No. 717,876

Int. Cl.[2] C07J *9/00, 15/00*

U.S. Cl. 260—397.2 1 Claim

1. Crystalline 9β,10α-cholesta-5,7-diene-3β,25-diol.

4,094,891
CIS-13-9-DEOXY-9,10-DIDEHYDRO-PGD$_2$ COMPOUNDS

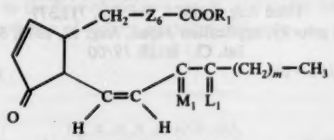
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184. This application Dec. 30, 1976, Ser. No. 755,990

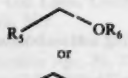
Int. Cl.[2] C07C *121/00*

U.S. Cl. 260—413 9 Claims

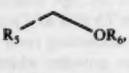
1. A prostaglandin analog of the formula



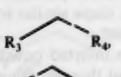
wherein m is one to 5, inclusive; wherein M_1 is



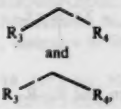
or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the outer is hydrogen; wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and

wherein Z_6 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—, or

(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,

wherein g is one, 2, or 3.

4,094,892
PROCESS FOR PREPARING OPTICALLY ACTIVE ESTERS

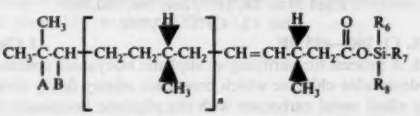
Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 723,401, Sep. 15, 1976, Pat. No. 4,045,475, which is a division of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application May 16, 1977, Ser. No. 796,918

Int. Cl.[2] C11C *3/02*

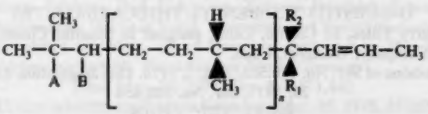
U.S. Cl. 260—410.9 R 1 Claim

1. A process of preparing a compound of the formula:

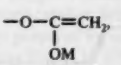


wherein n is an integer from 0 to 1; A and B are individually hydrogen or taken together form a carbon to carbon bond; R_6, R_7 and R_8 are lower alkyl;

comprising subjecting an optically active isomer of the formula:



wherein n, A and B are as above, one of R_1 and R_2 is hydrogen and the other is



R_1 is hydrogen, the 2-3 double bond has a trans configuration and that when R_1 is other than hydrogen, the 2-3 double bond has a cis configuration, M is an alkali metal;

by Claisen rearrangement by reaction with an agent of the formula:

wherein X is halogen, and R_6, R_7 and R_8 are as above.

4,094,893

ISONITRILE INTERCALATION COMPLEXES

Martin B. Dines, Westfield, N.J., assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 24, 1976, Ser. No. 744,637
Int. Cl.[2] C07F *11/00, 7/00, 7/28*
U.S. Cl. 260—429 R **15 Claims**

1. Complexes of the formula:

$$TX_2(RNC)_y$$

wherein TX_2 is the inorganic host in which T is a transition metal selected from the group consisting of titanium, zicronium, hafnium, vanadium, niobium, tantalum, molybdenum and tungsten and mixtures thereof and X is a chalcogenide selected from the group consisting of sulfur, selenium and tellurium and RNC is the isonitrile organic guest wherein R is selected from the group consisting of C_1 to C_{18} linear and branched alkyls, C_3 to C_{18} cyclic alkyls and C_7 to C_{18} aryl alkyls and *y* is a number ranging from 0.10 to 2.0.

4,094,894

PROCESS OF PURIFYING ALIPHATIC ISOCYANATES

Julian Theron Blackwell, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 23, 1977, Ser. No. 780,345
Int. Cl.[2] C07C *119/042*
U.S. Cl. 260—453 SP **11 Claims**

1. A process for purifying an aliphatic isocyanate containing hydrolyzable chlorine which comprises mixing finely divided dry alkali metal carbonate with the aliphatic isocyanate containing the hydrolyzable chlorine, at a temperature between 180° and 235° C.

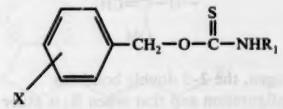
4,094,895

PROCESS FOR PREPARATION OF O-(SUBSTITUTED)BENZYL THIOCARBAMATES

Harry Tilles, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

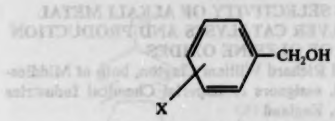
Division of Ser. No. 710,505, Aug. 2, 1976. This application Aug. 29, 1977, Ser. No. 828,456
Int. Cl.[2] C07C *153/09*
U.S. Cl. 260—455 A **2 Claims**

1. A process for production of a compound having the formula



in which X is hydrogen, mono- or dihalo or 2-methyl and R_1 is lower alkyl, lower alkenyl or p-chlorobenzyl, comprising:

(a) reacting an alcohol having the formula



with sodium hydride in the presence of tetrahydrofuran; and

(b) reacting the product of step (a) with a compound having the formula R_1-SCN.

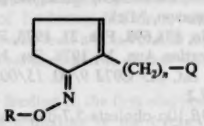
4,094,896

1-ALKOXIMINO-2-(ω-SUBSTITUTED-ALKYL)-2-CYCLOPENTENES

Karel Francis Bernady, Suffern; John Frank Poletto, Nanuet, both of N.Y., and Martin Joseph Weiss, Oradell, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 552,686, Feb. 24, 1975, Pat. No. 4,006,179, which is a division of Ser. No. 480,908, Jun. 19, 1974, Pat. No. 3,884,953, which is a division of Ser. No. 335,842, Feb. 26, 1973, Pat. No. 3,836,581, which is a continuation-in-part of Ser. No. 208,951, Dec. 16, 1971, abandoned. This application Dec. 2, 1976, Ser. No. 746,902
Int. Cl.[2] C07C *137/00*
U.S. Cl. 260—456 A **3 Claims**

1. Compounds of the formula:



wherein *n* is an integer from 3 to 8, inclusive; R is lower alkyl; and Q is p-toluenesulfonyloxy.

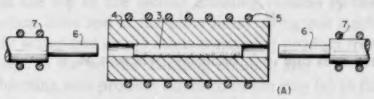
2. The compound according to claim 1 wherein R is methyl, *n* is 5, and Q is p-toluenesulfonyloxy.

4,094,897

RESIN-BONDED GRAPHITE BODY FOR A DRY CELL

Masahiro Nagasawa; Tomio Ishida, both of Hirakata, and Yoshitaka Yoshikawa, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 3, 1976, Ser. No. 711,377
Claims priority, application Japan, Aug. 12, 1975, 50/98207
Int. Cl.[2] B32B *19/00*
U.S. Cl. 264—105 **11 Claims**



1. A method of making a resin-bonded graphite body, comprising:

uniformly mixing, to form a dry powder mixture, 3 to 12 weight % of a thermosetting resin and 88 to 97 weight % of a carbonaceous powder which includes at least 50 weight % of natural crystalline graphite particles,

compressing said dry mixture by a first uniaxial pressure into a compressed powder rod having crystalline orientation;

inserting said compressed powder rod into a hollow of a mold which has a shape similar to the shape of said compressed powder rod;

pre-heating the thus inserted powder rod to the softening temperature of said thermosetting resin;

compressing the thus pre-heated rod by a second uniaxial pressure, the direction of which is perpendicular to the

direction of said first uniaxial pressure and parallel to the direction of the length of said powder rod as well as to the basal plane of said crystalline graphite particles;

heating said rod to the curing temperature of said thermosetting resin so as to harden said thermosetting resin, said orientation being maintained after said curing; and

removing the thus treated rod from said mold.

4,094,898
PROCESS FOR THE PREPARATION OF SODIUM METHALLYL SULFONATE

Wilhelm Knepper, and Dieter Jürgen Mueller, both of Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed Mar. 4, 1977, Ser. No. 774,567
Claims priority, application Germany, Mar. 11, 1976, 2610092
Int. Cl.² C07C *143/16*
U.S. Cl. 260—513 B **10 Claims**

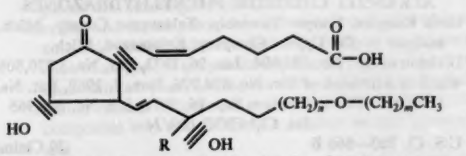
1. In a process for the preparation of an aqueous solution of sodium methallyl sulfonate by the reaction of methallyl chloride and aqueous sodium sulfite solution in an emulsion, the improvement which comprises employing technical methallyl chloride containing isocrotyl chloride; maintaining the pH of the reaction mixture at a constant value of from 7-11 during the reaction by metered addition thereto of sodium hydroxide solution; and conducting the reaction in two stages in a cyclical process wherein, in the first of the two stages, excess sodium sulfite is employed and the reaction is continued until the methallyl chloride therein is substantially entirely consumed and the resulting reaction product is fractionated by distillation to remove the isocrotyl chloride therefrom and leave as the residue an aqueous solution of sodium methallyl sulfonate and unreacted sodium sulfite; and wherein, in the second of the two stages, the thus-obtained aqueous solution of sodium methallyl sulfonate and unreacted sodium sulfite is reacted with excess technical methallyl chloride containing isocrotyl chloride, the reaction is continued until the sulfite therein has been substantially entirely consumed and the thus-obtained reaction product is fractionated by distillation to give as the distillate a mixture of methallyl chloride and isocrotyl chloride, which is recycled to the first of the two stages, and as the residue, an aqueous solution of sodium methallyl sulfonate.

4,094,899
OXAPROSTAGLANDINS

Hans-Jurgen E. Hess, Old Lime, China /Taiwan, assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 259,215, Jun. 2, 1972, abandoned. This application Apr. 30, 1973, Ser. No. 355,644
Int. Cl.² C07C *177/00*
U.S. Cl. 260—514 D **4 Claims**

1. A compound of the structure



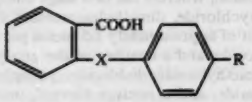
wherein R is hydrogen or alkyl having 1 to 3 carbon atoms, *n* is an integer of from 0 to 1 and *m* is an integer of from 0 to 4.

4,094,900
METHOD OF PREPARING ARYLOXYBENZOIC AND ARYLTHIOBENZOIC ACIDS

Elvin Lowell Anderson, Moorestown, N.J., and Gerald Aloysius Connelly, Darby, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed May 19, 1977, Ser. No. 798,283
Int. Cl.² C07C *149/40, 63/33*
U.S. Cl. 260—520 E **5 Claims**

1. A process for preparing aryloxybenzoic and arylthiobenzoic acids of the formula:

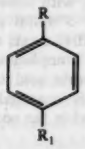


in which:

X is oxygen or sulfur;

R is halo, lower alkyl, lower alkoxy, thiomethyl or trifluoromethyl;

which comprises reacting 2-chlorobenzoic acid with a compound of the formula:



in which:

R_1 is hydroxy or mercapto; and

R is halo, lower alkyl, lower alkoxy, thiomethyl or trifluoromethyl;

in the presence of an alkali metal iodide and an alkali metal hydroxide or alkoxide base and heating at a temperature of from about 150° to about 220° C.

4,094,901
PROCESS FOR PREPARING ACETIC ACID

Helmut Schaum, Bad Soden am Taunus; Friedrich Schenk, Gotzenhain; Hartmut Voigt, Tarragona, and Rudolf Sartorius, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Mar. 29, 1976, Ser. No. 671,442
Claims priority, application Germany, Mar. 29, 1975, 2514095
Int. Cl.² C07C *51/26*
U.S. Cl. 260—530 R **5 Claims**

1. A process for preparing acetic acid by oxidation of acetaldehyde with oxygen or oxygen containing gases in the presence of a manganese acetate catalyst, which comprises subjecting the crude acetic acid prepared by said oxidation of acetaldehyde and still containing from 1 to 10% by weight of acetaldehyde, together with the gases formed in the acetic acid synthesis and still containing acetaldehyde, to an afteroxidation with oxygen or oxygen containing gases, distilling off the low-boiling by-products and acetic acid and directly recycling for reuse as catalyst in the initial oxidation the residue comprising manganese acetate, high-boiling by-products and acetic acid.

4,094,902

PROCESS FOR THE MANUFACTURE OF PHOSPHORIC ACID-TRIS-(DIMETHYLAMIDE)

Heinz Liberda; Hellmuth Spes, and Alfred Trommet, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Dec. 6, 1976, Ser. No. 747,573
Claims priority, application Germany, Dec. 23, 1975, 2558186
Int. Cl.[2] C07F 9/22
U.S. Cl. 260—551 P 10 Claims

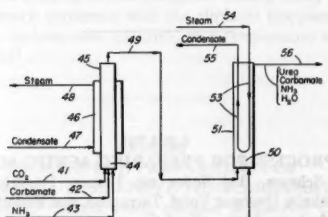
1. A process for the manufacture of phosphoric acidtris-(dimethylamide), which comprises two stages carried out in repeated succession, wherein the first stage comprises reacting phosphorus oxychloride, dimethylammonium chloride, in an average amount of approximately 1.5 moles per mole of phosphorus oxychloride, and a member of the group consisting of phosphoric dimethylamide dichloride, phosphoric bis-dimethylamide chloride, and a mixture thereof, under anhydrous conditions and at a temperature within the range of from 130°-240° C, to give a mixture consisting of phosphoric bis-dimethylamide chloride and phosphoric dimethylamide dichloride; and wherein a second stage comprises reacting at least a portion of said last-mentioned mixture containing on average approximately 1.5 gram-atoms of phosphorus-bonded chlorine per mole of phosphorus oxychloride used in the first stage and containing not more than 50 mole % of phosphoric dimethylamide dichloride, with dimethylamine in an average amount of approximately 3 moles per mole of phosphorus oxychloride used in the first stage, under anhydrous conditions; and wherein, after completion of the reaction of the second stage, the phosphoric acid tris-(dimethylamide) produced in the second stage is separated off and the dimethylammonium chloride produced in the second stage is returned to the first stage.

4,094,903

UREA SYNTHESIS WITH IMPROVED HEAT RECOVERY AND CONVERSION

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Division of Ser. No. 650,973, Jan. 21, 1976, which is a division of Ser. No. 190,519, Oct. 19, 1971, Pat. No. 3,952,055. This application Sep. 22, 1976, Ser. No. 725,442
Int. Cl.[2] C07C 126/02
U.S. Cl. 260—555 A 7 Claims



1. In a urea synthesis process wherein fluid NH_3 and fluid CO_2 are contacted and reacted at elevated pressure and temperature to form ammonium carbamate, and ammonium carbamate is converted to urea in a vertical cylindrical urea synthesis reactor, the improvement which comprises

(a) contacting from about 5 mol percent to less than 100 mol percent of a fluid NH_3 reactor feed stream and a fluid CO_2 reactor feed stream at substantially reactor pressure in a heat exchanger external (1) to the urea synthesis reactor to form ammonium carbamate in said heat exchanger and simultaneously removing from said external heat exchanger (1) heat of reaction evolved from reaction of NH_3 and CO_2 from said external heat exchanger (1), the NH_3 to CO_2 molar ratio inside said external heat exchanger (1) being from about 2.5 to about 3.5 to 1,

(b) charging the resulting reaction mixture into the lower portion of a reactor having an indirect heat exchanger (2) positioned therein which extends from the top portion to the lower portion of the reactor, said heat exchanger (2) including a heat exchange medium therein and having its inlet and its outlet located at the upper portion of the reactor,

(c) passing heated heat exchange medium from said inlet to said lower portion of said reactor thereby transferring heat therefrom to the total reaction mixture formed in (d) as the total reaction mixture passes upwardly in said reactor, and removing heat exchange medium from said outlet, said heat exchange medium being substantially cooler at said outlet than at said inlet, and

(d) charging remaining NH_3 reactor feed stream to said lower portion of said reactor, and mixing said remaining NH_3 with said resulting reaction mixture of (a) discharged from said external heat exchanger (1) into the lower portion of said reactor to form a total urea synthesis mixture having a NH_3 to CO_2 molar ratio of from about 2.8 to about 7 to 1.

4,094,904

PROCESS OF RACEMIZING AN OPTICALLY ACTIVE PHENYL GLYCINE AMIDE WITH OR WITHOUT A SUBSTITUTED PHENYL GROUP

Wilhelmus H. J. Boesten, Sittard, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Dec. 8, 1976, Ser. No. 748,398
Claims priority, application Netherlands, Dec. 9, 1975, 7514301
The portion of the term of this patent subsequent to Jul. 19, 1994, has been disclaimed.
Int. Cl.[2] C07C 103/28
U.S. Cl. 260—558 A 7 Claims

1. A process for racemizing an optically active form of phenyl glycine amide, consisting essentially of:

mixing an optically active form of phenyl glycine amide, a solvent for said phenyl glycine amide, a ketone, selected from the class of acetone, methylethyl ketone, pentanone, cyclohexanone, and mixtures thereof, and an acid having a dissociation constant below 1.8×10^{-4}, said ketone being present in an amount of at least 0.1 mole of ketone per mole of phenyl glycine amide; and

heating said mixture to a temperature between 30° and 150° C.

4,094,905

PROCESS FOR PRODUCING DIMETHYL FORMAMIDE

Kinichi Mizuno; Masao Saito; Yuzi Onda; Tetsuo Aoyama, and Kumiko Kato, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Ltd, Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,524
Claims priority, application Japan, Jun. 10, 1976, 51-68122
Int. Cl.[2] C07C 102/00
U.S. Cl. 260—561 R 12 Claims

1. A process for producing dimethyl formamide, which comprises making monomethyl formamide react with trimethylamine and carbon monoxide in the presence of a catalyst.

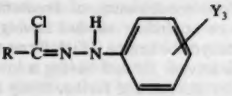
4,094,906

ALKANOYL CHLORIDE PHENYLHYDRAZONES

Girts Kaugars, Cooper Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 326,804, Jan. 26, 1973, Pat. No. 3,870,505, which is a division of Ser. No. 874,976, Nov. 7, 1969, Pat. No. 3,745,215. This application Sep. 16, 1974, Ser. No. 505,965
Int. Cl.[2] C07C 109/14
U.S. Cl. 260—566 B 20 Claims

1. New alkanoyl chloride (trihalophenyl)hydrazones of the formula:



wherein R is alkyl of from 2 to 5 carbon atoms, inclusive; Y is halogen, and the Y's may be selected independently.

4,094,907

PROCESS FOR THE PREPARATION OF POLYAMINES

Hartmut Knöfel, Leverkusen, and Günther Ellendt, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 17, 1976, Ser. No. 751,626

Claims priority, application Germany, Dec. 19, 1975, 2557500

Int. Cl.² C07C *85/24*

U.S. Cl. 260—570 D **16 Claims**

1. A process for the preparation of multinuclear aromatic polyamines by condensation of aromatic amines with formaldehyde in the presence of aqueous acid catalysts followed by neutralization of the catalyst and processing of the resulting reaction mixture in known manner, characterized in that free amine is removed from the reaction mixture leaving the last condensation stage by means of a hydrophobic solvent, optionally after partial neutralization of the catalyst but before neutralization of the total quantity of catalyst put into the process, and the amine thus removed is returned to the catalyst-containing aqueous phase by return of the resulting amine-containing solvent phase into said aqueous, catalyst-containing phase at any point before the last condensation stage.

4,094,908

ALPHA-SUBSTITUTED BENZHYDROL DERIVATIVES

Edit Toth; Jozsef Torley; Szabolcs Szeberenyi; Eva Palosi; Laszlo Szporny; Sandor Gorog, and Csilla Meszaros, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 495,847, Aug. 8, 1974, Pat. No. 4,039,589. This application Sep. 9, 1976, Ser. No. 722,063

Claims priority, application Hungary, Aug. 15, 1973, 2251/RI-521

Int. Cl.² C07C *93/08*

U.S. Cl. 260—570 R **2 Claims**

1. 4-(β-diethylaminoethoxy)-α-ethyl-benzyhydrol for a pharmaceutically acceptable salt thereof.

2. 3,4,5-trimethoxy-α-ethyl-benzyhydrol.

4,094,909

PROCESS FOR THE DECARBOXYLATION-OXIDATION OF BENZOIC ACID COMPOUNDS

Johan P. H. Von den Hoff, Geleen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Feb. 28, 1977, Ser. No. 773,127

Claims priority, application Netherlands, Feb. 28, 1976, 7602078; Aug. 27, 1976, 7609526

Int. Cl.² C07C *45/24, 27/26, 27/00, 29/24*

U.S. Cl. 206—586 P **19 Claims**

1. A process for the decarboxylation-oxidation of a substituted or unsubstituted benzoic acid compound, comprising:

heating said substituted or unsubstituted benzoic acid compound and forming a liquid phase,

reacting said liquid phase substituted or unsubstituted benzoic acid compound with molecular oxygen in the presence of a copper catalyst thereby forming a substituted or unsubstituted phenol compound by decarboxylation-oxidation of said substituted or unsubstituted benzoic acid compound and also forming a viscous tar-like product, and

hydrogenating said viscous tar-like product to form at least one low-boiling organic compound selected from the group consisting of substituted or unsubstituted benzene, phenol, cyclohexane, cyclohexanol and cyclohexanone.

4,094,910

PROCESS FOR PREPARING HALOGENATED AROMATIC HYDROXY ETHERS

Arthur Lawrence Austin, Southgate, and William Walter Levis, Jr., Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 23, 1976, Ser. No. 753,650

Int. Cl.² C07C *41/02*

U.S. Cl. 260—613 B **6 Claims**

1. A process for the selective oxyalkylation of a halogenated phenol to produce hydroxy ethers wherein the process is carried out at a reaction temperature of about 90° to about 250° C. for a period of about 1 hour to 100 hours using a catalyst concentration by weight of about 50 to about 20,000 parts per million, comprising:

(a) reacting a composition comprising said halogenated phenol with

(b) an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide, the isomeric normal butylene oxides, hexylene oxide, octylene oxide, dodecene oxide, methoxy and other alkoxy propylene oxides, styrene oxide, and cyclohexene oxide; halogenated alkylene oxides selected from the group consisting of epichlorohydrin, epiiodohydrin, epibromohydrin, 3,3-dichloropropylene oxide, 3-chloro-1,2-epoxypropane, 3-chloro-1,2-epoxybutane, 1-chloro-2,3-epoxybutane, 3,4-dichloro-1,2-epoxybutane, 1,4-dichloro-2,3-epoxybutane, 1-chloro-2,3-epoxybutane, and 3,3,3-trichloropropylene oxide; and mixtures of any said alkylene oxides in the presence of

(c) a catalyst selected from the group consisting of zinc, magnesium, a weak acid salt of zinc or magnesium, a zinc or magnesium halide or nitrate and mixtures thereof wherein said weak acid salt is selected from the group consisting of the carbonate, silicate, acetate, benzoate, citrate, formate, oxylate. stearate, tartrate, and mixtures thereof.

4,094,911

POLY(PERFLUOROALKYLENE OXIDE) DERIVATIVES

Ronald A. Mitsch, Little Canada, and Joseph La Mar Zollinger, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 805,885, Mar. 10, 1969, abandoned, which is a continuation-in-part of Ser. No. 70,540, Sep. 8, 1970, Pat. No. 3,810,874. This application Jun. 25, 1973, Ser. No. 373,200

Int. Cl.² C07C *43/30*

U.S. Cl. 260—615 A **11 Claims**

1. Linear functionally-terminated poly(perfluoroalkylene oxide) compounds having the formula

$$A—CF_2—O—(CF_2CF_2O)_m—(CF_2O)_n—CF_2—A'$$

where A and A′ are $—X_aYZ_b$ or $—X'_{a'}Y'Z'_{b'}$, X and X′ are each a polyvalent linking organic radical, Y and Y′ are each a polyvalent linking organic radical free of non-aromatic double bonds, Z and Z′ are each a polymerizable functional group, *a* and *a′* are zero or one, *b* and *b′* are integers of 1 to 3, *m* and *n* designate the number of randomly distributed perfluoroethyleneoxy and perfluoromethyleneoxy subunits, respectively, the ratio *m/n* being 0.2/1 to 5/1, said compounds having a number average molecular weight of 500 to 20,000, a glass transition temperature lower than −78° C, and polymerizable to polymers having recurrent backbone units of the formula $—CF_2O(CF_2CF_2O)_m(CF_2O)_n—CF_2—$ which impart to the polymers a glass transition temperature lower than −78° C.

4,094,912

PROCESS FOR CONVERTING AROMATIC ALDEHYDES TO PHENOLIC COMPOUNDS

Allen I. Feinstein, Wheaton; Shantaram G. Kane, Naperville, and Ellis K. Fields, River Forest, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 2, 1976, Ser. No. 738,084
Int. Cl.[2] C07C *39/04*
U.S. Cl. 568—802 11 Claims

1. A continuous process for the production of phenolic compounds from aromatic aldehydes having the chemical formula RCHO wherein R is selected from the group consisting of phenyl, biphenyl, naphtyl, anthacyl and phenanthryl radicals, which comprises the step of (1) continuously premixing in a preheat zone a composition consisting essentially of oxygen-containing gas, said aldehyde and inert gaseous diluent at a temperature of about 300° to 350° C wherein said inert gaseous diluent is selected from the group consisting of nitrogen, argon, steam, carbon dioxide and mixtures thereof and is present in a concentration sufficient for said composition to be outside the explosive limits, (2) continuously introducing said composition into a reactor and reacting said aldehyde and said oxygen-containing gas at a temperature of from about 400° to 600° C in the vapor phase in mole ratios of from 0.4 to 1 to 40 to 1 in said reactor maintained at 1 to 10 atmospheres pressure, maintaining said reactants in said reaction chamber for up to 10 seconds, thereby converting at least a portion of said aldehyde to phenolic compounds, and (3) quenching the reaction by continuously withdrawing and quenching the reaction products from said reactor at a temperature of from about 0° to about −80° C.

4,094,913

PROCESS FOR THE PREPARATION OF 2,5-DICHLOROPHENOL

Arthur W. Carlson, Crystal Lake, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jan. 7, 1977, Ser. No. 757,527
Int. Cl.[2] C07C *39/30*
U.S. Cl. 568—778 8 Claims

1. A process for preparing 2,5-dichlorophenol which comprises reacting 100 parts by weight 1-bromo-2,5-dichlorobenzene with 40 to 150 parts by weight of an alkali metal hydroxide and at least 120 parts by weight methanol in the presence of from about 0.1 percent to about 5.0 percent by weight based on the starting 1-bromo-2,5-dichlorobenzene of copper catalyst selected from the group consisting of cupric acetate, cupric ammonium chloride, cupric bromate, cupric bromide, cupric chlorate, cupric chloride, cupric formate, cupric lactate, cupric nitrate, cupric potassium chloride, cupric salicylate, cupric sulfate, cuprous bromide, cuprous chloride and cuprous sulfite at a temperature of from about 150° to about 210° C, acidifying the products, and thereafter recovering the desired product.

4,094,914

PROCESS FOR THE PRODUCTION OF DIVALENT ALCOHOLS

Walter Rottig; Hans Tummes, both of Oberhausen-Sterkrade-Nord; Boy Cornils, Dinslaken, and Jurgen Weber, Oberhausen-Holten, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holten, Germany

Continuation of Ser. No. 469,658, May 14, 1974, abandoned, which is a continuation of Ser. No. 193,994, Oct. 29, 1971, abandoned. This application May 12, 1976, Ser. No. 685,899
Claims priority, application Germany, Nov. 6, 1970, 2054601
Int. Cl.[2] C07C *29/14*
U.S. Cl. 568—862 9 Claims

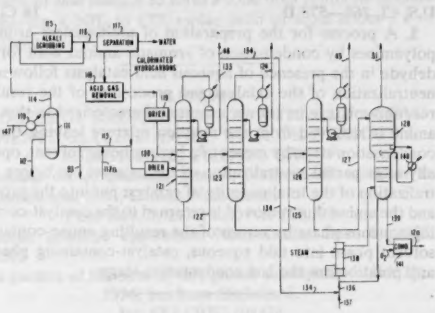
1. In a process for preparing a divalent alcohol by the catalytic hydrogenation of the hydroxyaldehyde corresponding to said divalent alcohol, the improvement which comprises hydrogenating at a temperature of 100° to 200° C., in a gaseous phase and in the presence of a hydrogenation catalyst, a mixture comprising up to 50% of a hydroxyaldehyde obtained through the aldol condensation of unsubstituted aldehydes, and a primary or secondary alcohol having 1 to 10 carbon atoms or an aldehyde or ketone which forms said alcohol, said alcohol being a solvent for and having a lower boiling point than the divalent alcohol and further being a solvent for the hydroxyaldehyde.

4,094,915

RECOVERY OF 12-DICHLOROETHANE FROM VINYL CHLORIDE PRODUCTION EFFLUENT

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 498,081, Aug. 16, 1974, Pat. No. 3,963,584. This application Jun. 11, 1976, Ser. No. 695,117
Int. Cl.[2] C07C *21/02*
U.S. Cl. 260—656 R 13 Claims



1. In the production of vinyl chlorine wherein there is separated from a vinyl chloride production reaction effluent a mixture comprising 1,2-dichloroethane and heavier chlorinated hydrocarbons, an improved process, comprising:

introducing said mixture comprising 1,2-dichloroethane and heavier chlorinated hydrocarbons into a stripping column;

introducing a stripping gas comprising ethane, ethylene or mixtures thereof into the heavier chlorinated hydrocarbon in the bottom of said stripping column to reduce the partial pressure of 1,2-dichloroethane over the heavier chlorinated hydrocarbons and strip 1,2-dichloroethane from said mixture, said stripping gas being introduced in a molar proportion and said stripping column being operated at a temperature and pressure to produce an overhead of 1,2-dichloroethane and stripping gas and a bottoms of heavier chlorinated hydrocarbons containing no greater than 1 weight % of 1,2-dichloroethane;

recovering from said stripping column a bottoms product of heavier chlorinated hydrocarbons containing no greater than 1 weight % of 1,2-dichloroethane;

recovering from the stripping column an overhead product of 1,2-dichloroethane and said stripping gas; and

introducing recovered overhead product into a dehydrochlorination reaction zone to produce vinyl chloride.

4,094,916

PROCESS FOR THE PRODUCTION OF ENDO-ENDO HEXACYCLIC DIMER OF NORBORNADIENE

Jeffrey R. Thomas, Aston, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Feb. 10, 1977, Ser. No. 767,600
Int. Cl.[2] C07C *1/00*
U.S. Cl. 260—666 A 7 Claims

1. Process for the dimerization of norbornadiene to its endo-endo hexacyclic dimer and hydrogenation of the dimer comprising:

(a) contacting a feed consisting essentially of norbornadiene with diethylaluminum chloride and a catalyst mixture of

ferric acetylacetonate and triphenylphosphine at a temperature between the range of from about 100° F to about 200° F and at a pressure between the range of from about atmospheric to about 500 psig and the amount of both the diethylaluminum chloride and the catalyst mixture is sufficient to dimerize the norbornadiene to the endo-endo hexacyclic dimer;

(b) maintaining the contacting for a residence time sufficient to form the endo-endo hexacyclic dimer;

(c) removing from the contacting a product mixture containing the formed endo-endo hexacyclic dimer and treating the mixture with methanol or water to deactivate the diethylaluminum chloride and the catalyst mixture;

(d) separating from the treated contacting product mixture aluminum hydroxide sludge formed during the deactivation;

(e) distilling the treated contacting product mixture from which the sludge was removed at a temperature below about 500° F to obtain both a distillate mixture and a bottom mixture wherein the distillate mixture contains any methanol or water not reacted during deactivation, unreacted norbornadiene and any solvent used with the diethylaluminum chloride; and the bottom mixture contains the endo-endo hexacyclic dimer, and other polymers formed during the contacting and any residue from the ferric acetylacetonate, triphenylphosphine, and the diethylaluminum chloride;

(f) vacuum distilling the bottoms mixture at a temperature below about 500° F to obtain both a distillate and bottoms and wherein the distillate has a boiling range of about 440° to about 560° F and the bottoms has an initial boiling point of about 550° F and contains the other polymers formed and any residue; and

(g) hydrogenating the about 550° F to about 550° F distillate so that essentially no unsaturation of the distillate containing the endo-endo hexacyclic dimer remains.

4,094,917

PROCESS FOR THE PRODUCTION OF EXO-EXO HEXACYCLIC DIMER OF NORBORNADIENE

Jeffrey R. Thomas, Aston, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Feb. 10, 1977, Ser. No. 767,598
Int. Cl.[2] C07C *1/00*
U.S. Cl. 260—666 A **6 Claims**

1. Process for the dimerization of norbornadiene to its exo-exo hexacyclic dimer and hydrogenation of the dimer comprising:

(a) contacting a feed consisting essentially of norbornadiene with diethylaluminum chloride and a catalyst mixture of ferric acetylacetonate and bis(1,2-diphenylphosphino)ethane at a temperature between the range of from about 100° F to about 220° F and at a pressure between the range of from about atmospheric to about 500 psig and the amount of both the diethylaluminum chloride and the catalyst mixture is sufficient to dimerize the norbornadiene to the exo-exo hexacyclic dimer:

(b) maintaining the contacting for a residence time sufficient to form the exo-exo hexacyclic dimer;

(c) removing from the contacting a product mixture containing the formed exo-exo hexacyclic dimer and treating the mixture with methanol or water to deactivate the diethylaluminum chloride and the catalyst mixture;

(d) separating from the treated contacting product mixture aluminum hydroxide sludge formed during the deactivation;

(e) distilling the treated contacting product mixture from which the sludge was removed at a temperature below about 500° F to obtain both a distillate mixture and a bottom mixture wherein the distillate mixture contains any methanol or water not reacted during deactivation, unreacted norbornadiene and any solvent used with the diethaluminum chloride; and the bottom mixture contains the exo-exo hexacyclic dimer, other polymers formed during the contacting and any residue from the ferric acetylacetonate, bis(1,2 diphenylphosphino)ethane, and diethylaluminum chloride;

(f) vacuum distilling the bottoms mixture at a temperature below 500° F to obtain both a distillate and bottoms and wherein the distillate has a boiling range of about 450° F to about 550° F and the bottoms has an initial boiling point of about 550° F and contains the other polymers formed and any residue; and

(g) hydrogenating the about 450° F to about 550° F distillate so that essentially no unsaturation of the distillate containing the exo-exo hexacyclic dimer remains.

4,094,918

HYDROALKYLATION PROCESS USING MULTI-METALLIC ZEOLITE CATALYST

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 10, 1977, Ser. No. 767,413
Int. Cl.[2] C07C *15/00*
U.S. Cl. 260—668 R **14 Claims**

1. A process for producing monocycloalkyl aromatic hydrocarbons comprising:

contacting an aromatic hydrocarbon under hydroalkylation conditions and in the presence of hydrogen with a catalyst comprising at least one component selected from the group consisting of rhodium and palladium compounds and mixtures thereof supported on a calcined, acidic, nickel and rare earth-treated crystalline zeolite selected from the Group consisting of Type X and Type Y zeolite.

4,094,919

HYDROCARBON CONVERSION PROCESSES AND CATALYSTS

Ivan James Samuel Lake, and Roy John Sampson, both of Middlesbrough, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 29, 1976, Ser. No. 671,545
Claims priority, application United Kingdom, Apr. 10, 1975, 14794/75; Apr. 10, 1975, 14793/75
Int. Cl.[2] C07C *5/24*
U.S. Cl. 260—668 A **16 Claims**

1. A process which comprises isomerising an alkyl aromatic hydrocarbon in the presence of a silica/alumina catalyst of which the alumina content has been reduced by at least 1% of the total alumina originally present, the catalyst comprising before treatment to lessen the alumina content 2 to 40% by weight of alumina and containing, after treatment from 2 to 5% of by weight.

4,094,920

HYDROALKYLATION USING MULTI METALLIC ZEOLITE CATALYST

Timothy P. Murtha, and Ernest A. Zuech, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 8, 1977, Ser. No. 766,640
Int. Cl.[2] C07C *15/00*
U.S. Cl. 260—668 R **14 Claims**

1. A process for producing monocyclicalkyl aromatic hydrocarbon and alkyl-substituted monocyclicalkyl aromatic hydrocarbon which comprises:

contacting a monocyclic aromatic hydrocarbon under hydroalkylation conditions and in the presence of hydrogen with a catalyst consisting essentially of at least one platinum compound supported on a calcined, acidic, nickel and rare earth-treated crystalline zeolite selected from the group consisting of Type X and Type Y zeolite which additionally has a halide content sufficient to promote the

selectivity of the catalyst to produce a desired cycloalkyl aromatic hydrocarbon.

4,094,921

SELECTIVE ETHYLATION OF MONO ALKYL BENZENES

Warren W. Kaeding, Westfield, and Lewis B. Young, Kendall Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 706,981, Jul. 19, 1976. This application Apr. 15, 1977, Ser. No. 787,716
Int. Cl.[2] C07C *3/52, 15/10*
U.S. Cl. 260—671 C 20 Claims

1. Process for the ethylation of a mono alkyl benzene wherein the alkyl substituent contains 1 to 2 carbon atoms to selectively produce the para and meta derivatives of said mono alkyl benzene to the substantial exclusion of the ortho derivative thereof which comprises contacting said mono alkyl benzene under conversion conditions, with ethylene in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, which zeolite is characterized by an activity, in terms of alpha value, of between about 2 and about 5000, a xylene sorption capacity greater than 1 gram/100 grams of zeolite and an ortho xylene sorption time for 30 percent of said capacity of greater than 10 minutes, said sorption capacity and sorption time being measured at 120° C. and a xylene pressure of 4.5 ± 0.8 mm. of mercury, said crystalline aluminosilicate zeolite further being characterized by a silica to alumina ratio of at least about 12, and a constraint index within the approximate range of 1 to 12, said catalyst having been subjected to steam treatment at a temperature between about 250° and about 1000° C. for a period of between about 0.5 and about 100 hours.

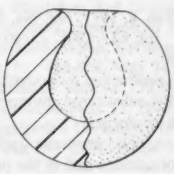
14. A process for the ethylation of a mono alkyl benzene wherein the alkyl substituent contains 1 or 2 carbon atoms to selectively produce the para and meta derivatives of said mono alkyl benzene to the substantial exclusion of the ortho derivative thereof which comprises contacting said mono alkyl benzene, under conversion conditions, with ethylene in the presence of a catalyst comprising a crystalline aluminosilicate zeolite characterized by a silica to alumina ratio of at least about 12, a constraint index within the approximate range of 1 to 12 and an alkali metal content of less than about 1.5 weight percent, said catalyst having been treated, prior to use, with an atmosphere containing from about 5 to about 100 percent steam at a temperature of from about 250° to about 1000° C for a period of between about 0.5 and about 100 hours.

4,094,922

ALKYLATION OF AROMATICS USING AMPHORA SHAPED CATALYSTS

Joseph P. Bartek, University Heights, and Robert K. Grasselli, Chagrin Falls, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 550,892, Feb. 18, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,482
Int. Cl.[2] C07C *3/52*
U.S. Cl. 260—671 C 11 Claims



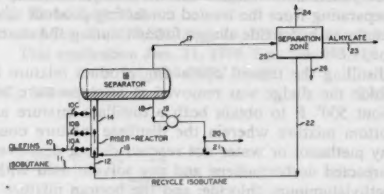
1. In a process for the alkylation of an aromatic hydrocarbon wherein the aromatic hydrocarbon is contacted with an alkylating agent in the presence of a fixed-bed acid catalyst at an elevated temperature, the improvement wherein at least a part of said catalyst has the amphora shape and a diameter of 1–10 mm.

4,094,923

ALKYLATION PROCESS UTILIZING DECREASING AMOUNTS OF OLEFIN IN RISER-REACTOR

Rolland E. Dixon, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 3, 1977, Ser. No. 765,328
Int. Cl.[2] C07C *3/54*
U.S. Cl. 260—683.48 4 Claims



1. In a process for producing alkylate by reacting an olefin with an isoparaffin in the presence of liquid HF acid catalyst, wherein said acid catalyst passes through a cyclic path through a vertical extended reaction zone into a settling zone for separating reaction mass into an alkylate phase and an HF acid phase, and a cooling zone for cooling HF acid phase returning from the settling zone to the inlet end portion of said reaction zone, the steps of producing high octane number alkylate which comprise:

(a) charging the total isoparaffin feed, including recycle isoparaffin, along with HF acid catalyst to said inlet end portion of said reaction zone forming an upwardly flowing mass that is flowing continuously through said reaction zone,

(b) introducing separate spaced streams of olefin into said reaction zone in decreasing quantities along the length of the reaction zone, the amounts of olefin introduced at each spaced point being sufficient to effect high isoparaffin to olefin molar ratios along the flow path of said mass, thereby avoiding the detrimental effects of unavoidable increases in reaction temperature along the reaction flow path of said mass, and

(c) recovering high octane alkylate product from said alkylate phase

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4,094,924

PROCESS FOR THE ALKYLATION OF LIGHT PARAFFINS WITH LOWER OLEFINS

Michael Siskin, Maplewood, and Ivan Mayer, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 586,591, Jun. 13, 1975, abandoned. This application Jul. 18, 1977, Ser. No. 816,801
Int. Cl.[2] C07C *3/54*
U.S. Cl. 260—683.51 28 Claims

1. An alkylation process wherein a paraffinic hydrocarbon feedstock comprising a component selected from the group consisting of methane, ethane, propane, n-butane and mixtures thereof, is alkylated under substantially anhydrous alkylation conditions with a C_2–C_5 olefin in the presence of a substantially liquid phase catalyst comprising (a) one or more Lewis acids selected from the group consisting of the fluorides, chlorides and bromides of vanadium, niobium, tantalum, chromium, molybdenum, tungsten, arsenic, antimony, phosphorus, bismuth and the chlorides and bromides of gallium and (b) a hydrogen halide, wherein the hydrogen halide is hydrogen fluoride, hydrogen chloride or hydrogen bromide, the molar ratio of said hydrogen halide to said Lewis acid ranging be-

tween 1:1 and about 100:1, and forming an alkylate having an average molecular weight greater than that of the feedstock.

4,094,925

COMPOUND AND ITS USE IN SYNTHETIC RESIN MIXTURES HAVING HIGH REACTIVITY UNDER THE ACTION OF IONIZING RAYS

Karl Jellinek, Letmathe, and Rudi Oellig, Duisburg-Meiderich, both of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

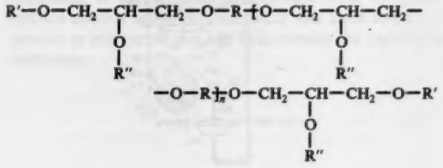
Filed Aug. 12, 1974, Ser. No. 497,168

Claims priority, application Germany, Aug. 25, 1973, 2343085

Int. Cl.[2] C08L *63/10*; C08F *8/00*; C08L *75/08*

U.S. Cl. 260—836 **11 Claims**

1. A composition polymerizable by ionizing radiation said composition comrising a compound of the formula:



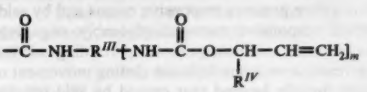
(I)

wherein

R is an organic radical;

R′ is an alkyl, cycloalkyl, aryl, aralkyl or acyl group;

at least half of all R″ radicals have the formula:



(II)

in which m is 1 or 2; and the remaining R″ radicals are hydrogen atoms;

R^{III} is a bivalent (when $m = 1$) or a trivalent (when $m = 2$) alkyl, cycloalkyl, aryl, aralkyl, carbamate or carbamide group;

R^{IV} is hydrogen or a methyl group; and

n is zero or a number up to 30; and

at least one vinyl monomer coplymerizable with said compound.

4,094,926

POLYMERIC PHOSPHORUS COMPOUNDS AND FLAME RETARDANT POLYETHYLENETEREPHTHALATE CONTAINING SAID POLYMERS

Dennis Richard Sheard, and Ian Stuart Fisher, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

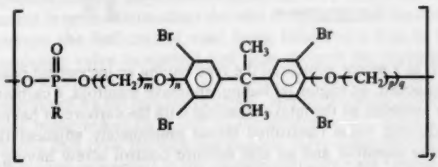
Filed Feb. 20, 1976, Ser. No. 659,628

Claims priority, application United Kingdom, Mar. 11, 1975, 10057/75

Int. Cl.[2] C08G *65/40*; C08L *67/02*

U.S. Cl. 260—860 **12 Claims**

1. A phosphorus-containing compound of the formula:



wherein R is phenyl or alkyl of 1 to 4 carbon atoms.

m and p are each independently integers from 2 to 6,

n and q are each independently integers from 1 to 10,

y is an integer of at least 2.

7. Flame retardant polyethylene terephthalate comprising a minor proportion of a compound according to claim 1.

4,094,927

PROCESS FOR IMPROVING THE PROCESSABILITY OF POLYOLEFINS, IMPROVED POLYOLEFIN COMPOSITIONS, AND MODIFIER COMPOSITIONS

William H. Harrop, Downingtown; David Witiak, Yardley, both of Pa., and Russell A. LaBar, Grafton, Wis., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 587,482, Jun. 16, 1975, abandoned. This application Feb. 14, 1977, Ser. No. 768,514

Int. Cl.[2] C08F *2/00*; C08L *23/00*; C08F *220/04, 4/38*

U.S. Cl. 260—897 B **9 Claims**

1. A composition comprising a blend of a polyolefin of the formula

$$CH_2{=}CHR$$

wherein R is H, C_nH_{2n+1} and n is 1 to 4, C_6H_5, or $C_6H_4CH_3$, and a minor amount of the acrylic polymer of one or more C_{10} to C_{22} alkyl methacrylates with one or more monomers selected from the group consisting of acrylic acid, methacrylic acid and isobornyl methacrylate wherein the molecular weight ratio of methacrylates to other monomers is about 91:9 to 87:13.

4,094,928

CARBONYLALDIMINOMETHANEPHOSPHONATES

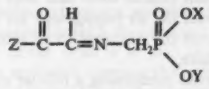
Van Russell Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 531,586, Dec. 11, 1974, abandoned. This application Jul. 29, 1977, Ser. No. 820,195

Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—944 **6 Claims**

1. A carbonylaldiminomethanephosphonate compound of the formula



wherein X and Y are each individually hydrogen or lower alkyl and Z is hydrogen, hydroxyl or lower alkoxyl.

4,094,929

PROCESS FOR MANUFACTURE OF AMIDOPHOSPHATES

Hermann Nachbur, Dornach, and Peter Rohringer, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 10, 1976, Ser. No. 684,988

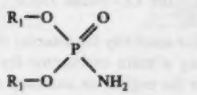
Claims priority, application Switzerland, May 15, 1975, 6264/75

Int. Cl.[2] C07F *9/24*; D06M *1/00*

U.S. Cl. 260—968 **8 Claims**

1. Process for the manufacture of amidophosphate reaction products which comprises reacting together at temperatures of 20° to 80° C. with or without acidic or basic catalysts

(1) 1 or 2 moles of an amidophosphate of the formula



(I)

wherein

R_1 is alkyl with 1 to 3 carbon atoms, or both R_1's together are alkylene with 2 to 5 carbon atoms,

(2) 1 mole of formaldehyde or an agent releasing formaldehyde,

(3) an aliphatic diol with 2 to 6 carbon atoms, and/or

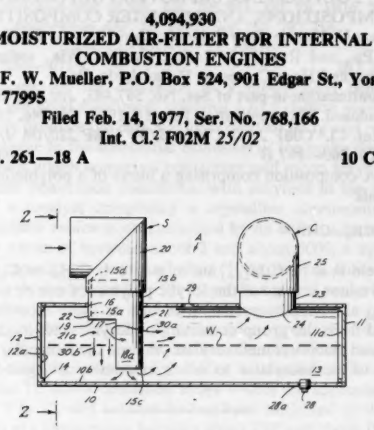
(4) an alkanol with 1 to 3 carbon atoms, and if the constituent (3) is used, R_1 in the amidophosphate of the formula (1) is also alkenyl or halogenoalkyl with 2 or 3 carbon atoms.

4,094,930

MOISTURIZED AIR-FILTER FOR INTERNAL COMBUSTION ENGINES

Henry F. W. Mueller, P.O. Box 524, 901 Edgar St., Yoakum, Tex. 77995

Filed Feb. 14, 1977, Ser. No. 768,166
Int. Cl.² F02M *25/02*
U.S. Cl. 261—18 A **10 Claims**



1. An apparatus for moisturizing air for an air intake of an internal combustion engine, comprising:

container means forming a chamber holding a quantity of water to only partially fill same so as to leave an air passageway above the water;

air inlet means for admitting air into the container means at one area thereof and communicating with the air passageway;

discharge means for discharging air from an area of the container means remote from said inlet means and communicating with the air passageway for conveying moisturized air from the chamber to an internal combustion engine air intake;

said air inlet means comprising a tubular member, sealingly secured to an opening in the container means, with a portion thereof extending internal to the container means; and

said portion internal to the container means having a semi-tubular portion removed on a side which is opposite to the discharge means thereby forming a substantially horizontal wall surface which is below the opening, at its lowermost point, in the container means and a remaining semi-tubular portion which extends substantially below the water surface in such a manner as to partially segregate the container means into two areas and forming a passageway below the water surface permitting communication between said areas of the container means.

4,094,931

CARBURETOR ASSEMBLY

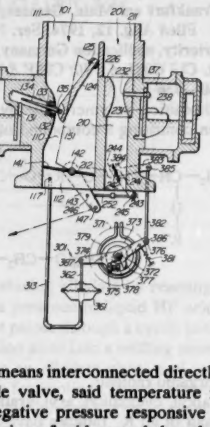
Kimiji Karino, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 23, 1976, Ser. No. 744,399
Claims priority, application Japan, Nov. 28, 1975, 50-141618
Int. Cl.² F02M *13/04*
U.S. Cl. 261—23 B **12 Claims**

8. In a carburetor assembly for internal combustion engines of the type having a main carburetor for supplying a lean air-fuel mixture to the engine, an auxiliary carburetor for supplying an air-fuel mixture to the engine which is rich relative to that supplied by said main carburetor, and first and second throttle valves mounted in said main and auxiliary carburetor respectively, the improvement comprising:

temperature responsive means for producing a closing movement of said second throttle in accordance with increases in the temperature of said engine;

negative pressure responsive means for producing a closing movement of said second throttle valve in accordance with negative pressures on a downstream side of said main throttle valve; and



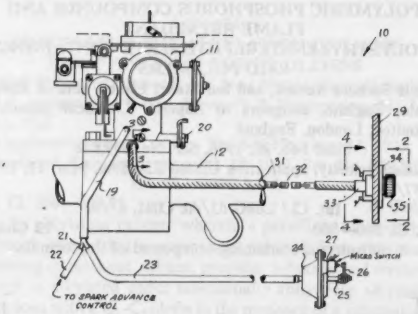
a mechanical linkage means interconnected directly between said second throttle valve, said temperature responsive means, and said negative pressure responsive means for effectuating the closing of said second throttle means by said negative pressure responsive means and by said temperature responsive means displaceably engaging said linkage means, said linkage means permitting said temperature responsive means to cause closing movement of said second throttle beyond that caused by said pressure responsive means and independent of said first throttle means as said engine warms up.

4,094,932

CARBURETOR CHECKING AND ADJUSTING APPARATUS

Kenneth L. Knox, Sr., 1796 Hillboro Ave., Reno, Nev. 89502

Filed Dec. 9, 1976, Ser. No. 749,079
Int. Cl.² F02M *3/08*
U.S. Cl. 261—41 D **3 Claims**



1. In a motor vehicle of the type having an instrument panel dashboard, an engine including, an intake manifold, a carburetor mounted on the intake manifold with the carburetor having a throttle valve controlled throat immediately adjacent the intake manifold and an idle mixture control screw having a transverse slot, said screw being adjacent the intake manifold in combination with a carburetor checking and adjusting appa-

ratus comprising a vacuum conduit extending from the carburetor, a vacuum actuated normally closed electric switch connected to said vacuum conduit and responsive to the vacuum in the carburetor to open said electric switch, an indicator bulb mounted on said dashboard, a hand controlled electric switch on said dashboard, electric wiring connecting said electric switch, said hand controlled electric switch and said bulb to energize said bulb when said switches are both closed, a flexible cable connected on one end to said idle mixture control screw wherein said cable and said screw are interconnected by coupling means having a first blade which engages said slot of said control screw at one extremity and a second blade which engages a slot associated with said flexible cable remote from said first blade for transmitting rotation therethrough, and bracket means overlying said cable fastening said cable to a portion of the engine to maintain alignment between said cable and said screw, and a hand controlled knob on said dashboard connected to the opposite end of said cable to rotate said mixture control screw on rotation of said knob to control the mixture in said carburetor and thus varying the vacuum in said carburetor.

4,094,933

SUPPLYING FUEL TO INTERNAL COMBUSTION ENGINES

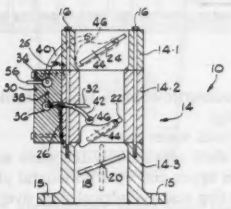
Marthinus Johannes Schoeman, 13-14th Avenue, Edenvale, Transvaal Province, South Africa

Filed Aug. 26, 1976, Ser. No. 717,929

Claims priority, application South Africa, Sep. 23, 1975, 75/6062

Int. Cl.² F02M 7/22

U.S. Cl. 261—50 A **13 Claims**



1. A carburettor for an internal combustion engine, which includes a duct connectable to a combustible charge inlet of the engine; a butterfly valve pivotally mounted within the duct and connectable to a throttle linkage of the engine to permit control of airflow through the duct; a fuel control vane and a vacuum inducing vane pivotally mounted within the duct upstream of the butterfly valve and biassed by biassing means to operate in conjunction with airflow through the duct; and a housing provided exteriorly of the duct, the housing having an inlet adapted for connection to a fuel source, an outlet passage leading into the duct, and at least one valve means intermediate the inlet connection and the outlet passage for regulating fuel flow into the duct, the valve means including an independently operable control valve and a regulating valve which are connected in series intermediate the inlet connection and the outlet passage, the fuel control vane being linked by a link to the regulating valve to control fuel flow through the regulating valve dependent upon the rate of airflow through the duct as determined by the fuel control vane, and the vacuum inducing vane being linked by a link to the control valve thereby to control fuel flow through the control valve dependent upon the pivotal movement of the vacuum inducing vane caused by airflow through the duct.

4,094,934

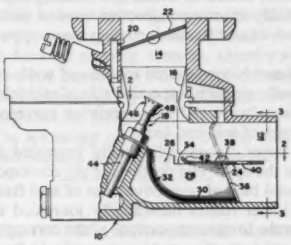
HORIZONTAL UPDRAFT CARBURETOR

Charles H. Tuckey, and Roy J. Tuckey, both of Caro, Mich., assignors to Tuckey Corporation, Caro, Mich.

Filed Feb. 23, 1977, Ser. No. 771,817

Int. Cl.² F02M 1/02

U.S. Cl. 261—64 R **4 Claims**



1. In a carburetor having housing means defining a vertically extending mixing chamber communicating at its lower end with a horizontally extending air intake passage, nozzle means projecting into the lower portion of said mixing chamber for discharging a fuel mixture into said chamber, and a choke plate mounted within said housing for pivotal movement about a horizontal axis extending transversely of said intake passage between a closed position blocking said inlet passage and an open position wherein said plate lies in a horizontal general plane within said passage; the improvement comprising a pair of spaced parallel vertical side plates projecting upwardly from the bottom of said inlet passage at locations spaced inwardly from the sides of said inlet passage between said choke plate and said mixing chamber, a rear wall extending transversely between said side plates and curving smoothly upwardly from said bottom of said inlet passage beneath said nozzle means, said side plates and said rear wall defining a flow passage in the lower central portion of said intake passage of a cross-sectional area substantially less than that of said intake passage for smoothly deflecting air flowing therethrough upwardly toward said nozzle means, said side plates having parallel front edges engageable with the rearward side of said choke plate when said choke plate is in said closed position, and means defining a restricted opening through said choke plate constituting an inlet to said flow passage when said choke plate is in said closed position.

4,094,935

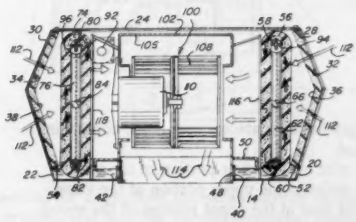
EVAPORATIVE COOLING SYSTEM

Wesley M. Walker; Robert W. Walker, and Dean M. Walker, all of Loveland, Colo., assignors to Walker Manufacturing Company, Ft. Collins, Colo.

Filed Dec. 3, 1976, Ser. No. 747,396

Int. Cl.² B60H 1/26

U.S. Cl. 261—80 **1 Claim**



1. An evaporative cooling system comprising:

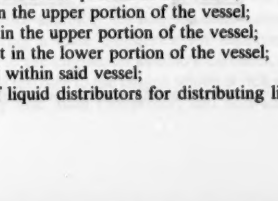
a housing having generally upright respectively-opposing side walls and end walls joined by generally horizontal top and bottom walls;
means defining a pair of inlet openings individually in respective ones of said side walls;
means defining an outlet opening in another of said walls of said housing;
a pair of vertically-oriented generally planar rigid frames individually locatable within said housing adjacent to and substantially spanning respective ones of said inlet openings, each of said frames including space-opposed vertical end bars;
vertical channelways secured to said end walls and disposed individually on each respective side of said inlet openings, said channelways slidingly receiving corresponding different ones of said end bars;
a pair of upper rollers individually journaled for rotation between the upper end portions of the corresponding ones of said end bars of respective ones of said frames;
a pair of lower rollers individually journaled for rotation between the lower end portions of the corresponding ones of said end bars of respective ones of said frames;
a pair of endless belts individually wrapped around respective different ones of the respective combinations of said rollers and frames so as to have a hollow oblong cross section elongated in a vertical direction, said belts each being of a material to which a liquid may cling and sufficiently transparent to the flow of air therethrough to achieve evaporation of said liquid on said belt by the air;
means defining a reservoir of said liquid disposed in the lower portion of said housing and into which said lower rollers normally are immersed in use so that a portion of said belts also are immersed;
motive drive means disposed within said housing;
coupling means on each of said upper rollers for engagement with said motive drive means to drive such rollers in rotation, directly upon seating of said end bars within said channelways;
means, in addition to said belts, individually coupled between respective different ones of said upper and lower rollers for driving said lower rollers from the corresponding ones of said upper rollers;
and blower apparatus disposed in said housing and substantially occupying the space between said frames for drawing air through said inlet openings and said belts and exhausting said air through said outlet opening.

4,094,936

PACKED BED GAS-LIQUID CONTACTOR

Jorge M. Fernandez-Baujin, North Bergen, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Feb. 16, 1977, Ser. No. 768,958
Int. Cl.[2] B01D *47/14, 53/20*
U.S. Cl. 261—96 **6 Claims**



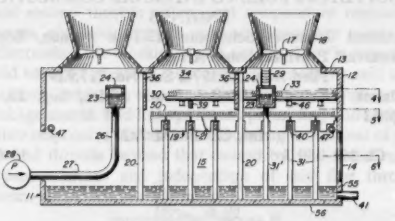
1. A gas-liquid contactor apparatus, comprising:
a vessel;
a gas inlet in the lower portion of the vessel;
a gas outlet in the upper portion of the vessel;
a liquid inlet in the upper portion of the vessel;
a liquid outlet in the lower portion of the vessel;
a packed bed within said vessel;
a plurality of liquid distributors for distributing liquid into the packed bed, said plurality of liquid distributors being supported within and solely by said packed bed, said liquid inlet introducing the liquid into the liquid distributors, said packed bed including a lower portion below the liquid distributors and an upper portion above the liquid distributors, said lower portion of the packed bed being comprised of process packing, said upper portion of the packed bed being comprised of an imperforate structure and non-process packing, said imperforate structure blocking a portion of the upper portion of the packed bed and being comprised of a plurality of separate imperforate columns which extend from liquid distributors upwardly to the top of the packed bed, the remaining portion of said upper portion of the packed bed being comprised of said non-process packing whereby gas flows through a limited portion of the upper portion of the packed bed defined by the non-process packing to reduce the gas residence time in the upper portion of the bed.

4,094,937

CYLINDRICAL MULTI-FAN COUNTERFLOW COOLING TOWER

Gaylord E. Bodick, and Martin V. Gruber, both of Erie, Pa., assignors to Zurn Industries, Inc., Erie, Pa.

Filed Apr. 15, 1976, Ser. No. 677,401
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—111 **11 Claims**



1. A round, counterflow, multi-fan, mechanical draft cooling tower comprising,
a cylindrical cold water basin,
a cylindrical shell substantially the same size as said basin, closed at its upper end by a horizontal planar deck,
means supporting said cylindrical shell over said cold water basin in spaced relation thereto,
said deck being attached to the upper end of said cylindrical shell,
spaced columns extending from said deck to said cold water basin supporting said deck at positions spaced inwardly from said cylindrical shell,
said deck having at least five symmetrically arranged, uniformly spaced openings therein with at least four openings adjacent the periphery of said shell and at least one opening in the center,
a fan supported in each said opening,
a fill pack of generally cylindrical configuration having a diameter substantially equal to the inside diameter of said cylindrical shell and positioned below said deck defining a plenum chamber between said deck and said fill pack,
a drift eliminator in said plenum chamber above and adjacent said fill pack,
and means below said drift eliminator above said fill pack for distributing water to be cooled generally uniformly over said fill pack,
said fans being adapted to draw air through said space between said cold water basin and said shell, through said fill pack, and through said drift eliminator,
whereby some of said water is evaporated and discharged by said fans,

the remaining portion of said water releases heat to said evaporated water and is thereby cooled and flows to said cold water basin for use as cold water,

said cylindrical fill pack being supported below said drift eliminator in closely spaced relation to said drift eliminator,

said drift eliminator being supported below said deck at a distance approximately equal to the diameter of said fans,

said fill pack being supported above said cylindrical cold water basin defining a generally cylindrical open space between said fill pack and said basin adapted to contain air at a substantially uniform pressure throughout, whereby the air adjacent the lower side of said fill pack is at a generally uniform pressure, radially-extending partition walls provided in said plenum chamber comprising barriers preventing the recirculation of air inside said plenum chamber and providing a flow passage for air to each said fan whereby said fans operate independently of one another.

4,094,938

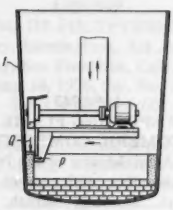
METHOD AND APPARATUS FOR LINING LADLES

Serafim Vasilievich Kolpakov, ulitsa Ryazanskaya, 12; Zinovy Lvovich Gurkov, ulitsa Parkovaya, 4, kv. 42; Oleg Leonidovich Bondarenko, ulitsa M. Gorkogo, 13/2, kv. 1; Vladimir Viktorovich Valtsov, ulitsa Anosova, 2, kv. 25; Alexandr Mikhailovich Pozhivanov, ulitsa Zhelyabova, 16, kv. 8; Eduard Dmitrievich Gugnin, ulitsa Gagarina, 167, kv. 8; Stanislav Vyacheslavovich Radilov, ulitsa Tereshkovoi, 38b, kv. 34, and Alexandr Andreevich Bogdanov, ulitsa Parkovaya, 6, kv. 4, all of Lipetsk, U.S.S.R.

Continuation of Ser. No. 449,466, Mar. 8, 1974, abandoned. This application May 28, 1976, Ser. No. 691,079

Int. Cl.[2] F27D *1/16*

U.S. Cl. 264—30 **6 Claims**



1. A method for high-density lining inner spaces, confined by the inner surface of a ladle and by a backing shaping element therein, with a refractory mass along the inner circumferential perimeter of the ladle wall and along the entire height thereof, comprising the steps of:

feeding the mass at a speed of 60 m/sec. into spaces confined between the inner surface of the ladle and the backing shaping element therein along a helical trajectory;

applying the fed-in mass to the inner surface with at least one blasting means in close proximity to the inner ladle perimeter, with a force applied perpendicularly to the upper surface of the lining layer as the lining is being applied;

positioning the backing shaping element initially at a distance equal to the initial thickness of the lining in the bottom of the ladle;

imparting to the blasting means a continuous circular movement along the inner perimeter and parallel thereto;

positioning the backing shaping element behind the blasting means and free of physical contact with the inner ladle perimeter to ensure a predetermined narrow gap being filled with the mass to deliver the refractory mass along the ladle wall being lined into said space between the ladle wall and the shaping element;

additionally imparting to the blasting means continuous vertical movement along the entire height of the ladle as the lining is completing the perimeter; the backing shaping element also being moved upward continuously, in addition to and simultaneously with its continuous circular movement along the inner ladle perimeter;

maintaining the distance between the blasting means and the upper surface of the lining constant during the vertical movement to create identical conditions for the passage of the refractory mass applied to the blasting means;

maintaining the lining layer at a minimum thickness in accordance with the narrow gap;

simultaneously and continuously moving the blasting means radially with respect to the surfaces being lined, together with the backing shaping element, thereby obtaining a continuous and successive filling of the lining with the minimum thickness along a helical trajectory over the entire height of the ladle; and,

reducing the scattering of the mass by the blasting means during said feeding and said applying steps.

4,094,939

METHOD OF REPAIRING ADOBE MASONRY

Robert J. Rowlands, #20 3940 N. Romero Rd., Tucson, Ariz. 85705, assignor to Robert J. Rowlands and Letha B. Rowlands, as JTWTROS, Tucson, Ariz.

Filed Jun. 30, 1976, Ser. No. 658,690

Int. Cl.[2] E04B *1/16*

U.S. Cl. 264—35 **3 Claims**

1. The method of repairing adobe members having a deteriorated, broken or chipped portion and a body portion comprising: removing any residual broken or chipped pieces of the chipped portion to expose a surface of said body portion; cleaning said exposed surface; coating said cleaned exposed surface with a coating composition formed of a modified acetate homopolymer and water; filling said chipped portion with a patching composition of trowelling consistency formed from an admixture of water, Portland cement, washed sand and sufficient adobe dust to match the color of said body portion; shaping the filling composition to conform to the shape or the original adobe member; and coating the shaped filling with said coating composition.

4,094,940

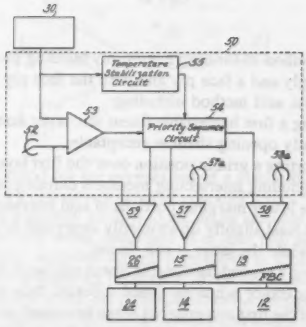
INJECTION MOLDING MACHINE CONTROLS

Peter Hold, Milford, Conn., assignor to USM Corporation, Farmington, Conn.

Division of Ser. No. 435,348, Jan. 21, 1974, Pat. No. 3,937,776, which is a continuation of Ser. No. 194,280, Nov. 1, 1971, abandoned. This application Apr. 22, 1974, Ser. No. 462,960

Int. Cl.[2] B29F *1/08*

U.S. Cl. 264—40.6 **3 Claims**



1. A method for controlling the parameters of an injection molding process, said molding process including: feeding material into a plasticating chamber, applying, by the use of heaters, a predetermined amount of heat to the chamber which is calculated to cause the plasticated material to reach a predeter-

mined standard temperature, rotating a plasticating screw located in the chamber at a predetermined speed to plasticate the material, slidably retracting the screw during plastication, under a predetermined back pressure, to a charged position to collect a predetermined quantity of plasticated material ahead of the screw, and injecting the material into a mold by a forward sliding thrust of the screw, said control method comprising:

A. detecting the temperature of the plasticated material;

B. comparing the temperature of the plasticated material with the predetermined standard temperature; and

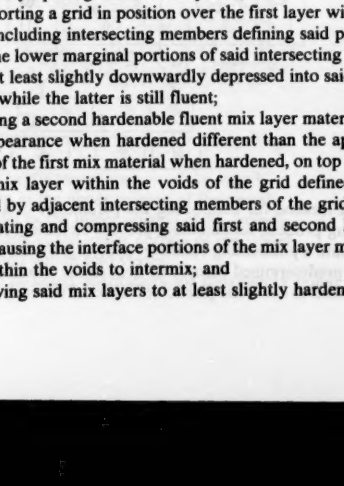
C. adjusting the supply of heat energy to the plasticating chamber to compensate for any difference in the temperature of the plasticated material and the standard temperature, for subsequent injection cycles by selectively adjusting rotational screw speed, back pressure, and the heat applied by the chamber heaters according to a priority sequence which maximizes the input of mechanical energy.

4,094,941

METHOD AND APPARATUS FOR MAKING DECORATIVE PANELS IN RELIEF

Stanley H. Manners and Gerhard Borbonus, both of Boise, Id., assignors to Stanley H. Manners, Boise, Id., a part interest

Filed May 3, 1976, Ser. No. 682,893
Int. Cl.[2] B28B *1/08, 1/16*
U.S. Cl. 264—71 **6 Claims**



1. The method of forming a multi-ply building panel including a back ply and a face ply and with the face ply defining a relief pattern, said method including:

(a) placing a first hardenable fluent mix layer material in an upwardly opening shallow receptacle;

(b) supporting a grid in position over the first layer with the grid including intersecting members defining said pattern and the lower marginal portions of said intersecting members at least slightly downwardly depressed into said first layer while the latter is still fluent;

(c) placing a second hardenable fluent mix layer material, of an appearance when hardened different than the appearance of the first mix material when hardened, on top of the first mix layer within the voids of the grid defined and bound by adjacent intersecting members of the grid;

(d) vibrating and compressing said first and second layers thus causing the interface portions of the mix layer materials within the voids to intermix; and

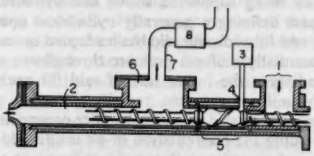
(e) allowing said mix layers to at least slightly harden.

4,094,942

METHOD FOR REMOVING UNREACTED MONOMER

Setsuo Nakai, and Hiroshi Ochi, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and The Japan Steel Works, Ltd., Tokyo, both of, Japan

Filed Jan. 19, 1976, Ser. No. 650,440
Int. Cl.[2] B29F *3/03*
U.S. Cl. 264—102 **6 Claims**



1. A method for removing unreacted monomer or monomers from a molten ethylene homopolymer or a copolymer of ethylene with at least one monomer copolymerizable with ethylene during the course of pelletization by use of an extruder, said polymer having been formed by high-pressure polymerization by use of a radiation or a radical initiator, discharged from the reactor by way of a separator, and fed to said extruder to be pelletized, which method comprises injecting into a nose portion of a mixing section of said extruder 0.1 to 10% by weight, based on said polymer of water or steam, intermixing the polymer and the water or steam in the mixing section of the extruder screw, and removing the unreacted monomer and water or steam contained in the mix from the venting zone provided after the mixing section in the extruder under application of a vacuum of 500 mmHg absolute or less.

4,094,943

PROCESS FOR SPINNING FLAME RETARDANT ELASTOMERIC COMPOSITIONS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; John T. Howarth, Reading; Suresh Sheth, Somerville; Kenneth R. Sidman, Wayland, and Arthur A. Massucco, Natick, all of Mass.

Division of Ser. No. 374,421, Jun. 28, 1973, Pat. No. 3,956,233. This application Feb. 13, 1976, Ser. No. 657,998
Int. Cl.[2] B29H *21/04*
U.S. Cl. 264—130 **6 Claims**

1. A method of producing a fire retardant, elastomeric filament comprising:

(a) forming a solution of an elastomeric composition in a solvent, said elastomeric composition being selected from the class consisting of (1) a polyurethane comprising an organic polyisocyanate and a halogen containing polyol, the reactive groups of said polyol being hydroxyl groups, (2) an elastomeric normally flammable polyurethane and a fire retardant additive selected from the class consisting of hexabromobenzene, decabromodiphenyl, tricresyl phosphate, tris-1-bromochloropropyl phosphate, tris-2,3-dibromopropyl phosphate and mixtures thereof and (3) mixtures thereof;

(b) forming a plurality of fibers from the solution of Step (a);

(c) passing said plurality of fibers formed in Step (b) through an aqueous bath, said aqueous bath containing in addition the solvent of Step (a);

(d) removing said excess aqueous solution and forming said plurality of fibers into a coalesced filament; and

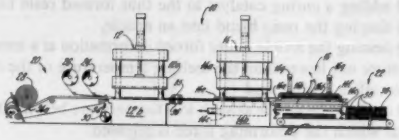
(e) drying said coalesced filament obtained from Step (d).

4,094,944

MACHINE FOR AND CONTINUOUS PROCESS OF MAKING MOLDED TILE

Frederic Harold Paetz, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 22, 1976, Ser. No. 734,772
Int. Cl.[2] B29C 27/22; B29D 3/02
U.S. Cl. 264—137 5 Claims



1. A continuous process of making molded ceiling tile comprising intermittently feeding a strip of fibrous glass wool having uncured binder thereon and a strip of facing material into a molding press having multi-cavity upper and lower die plates relatively movable toward and away from each other, molding the wool and facing material in the molding press into a cluster of molded tiles by clamping them between the upper and lower die plates under pressure while applying heat to cure the binder, said molding including the forming of a pair of oppositely projecting tabs on each of said tiles, feeding the cluster of molded tiles from the molding press into a severing press while feeding other portions of the strips attached to the cluster into the molding press, said feeding including drivingly engaging said tabs with movable driving means, and severing the cluster in the severing press from the strips and the molded tiles in the cluster into separate tiles arranged in a plurality of rows of tiles by operation of the severing press while molding another cluster of tiles in the molding press.

4,094,945

SPINNING OF POLYPYRROLIDONE

A. Charles Tanquary, Birmingham, Ala., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 16, 1976, Ser. No. 714,461
Int. Cl.[2] D01F 6/00
U.S. Cl. 264—184 10 Claims

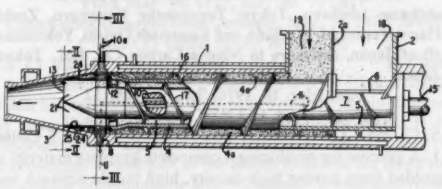
1. A process for forming filaments of polypyrrolidone which comprises extruding through a spinneret a solution comprising polypyrrolidone, formic acid and methylene chloride.

4,094,946

STRIPED SOAP, ITS PRODUCTION AND APPARATUS FOR ITS PRODUCTION

Friedhelm Finkensiep; Reinhold Walter Meye, both of Krefeld, and Gunter Thor, Krefeld-Traar, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Germany

Filed Jun. 14, 1976, Ser. No. 695,455
Claims priority, application Germany, Jun. 16, 1975, 2526917
Int. Cl.[2] B29F 3/06
U.S. Cl. 264—171 3 Claims



1. A process for the production of two-color striped pieces of soap comprising the steps of continuously extruding two strands of colored soap from a single extruder having an inner and an outer extrusion path, the outer strand encompassing the inner strand and each strand having a different color, said extrusion being at an equal rate for each strand, passing said two strands of colored soap through separate die orifices within a radial cross-section whereby said two strands of colored soap are combined in a predetermined cross-section with said inner strand having a cross-section other than circular, and compressing said combined strand, cutting said compressed combined strand and recovering two-colored striped pieces of soap.

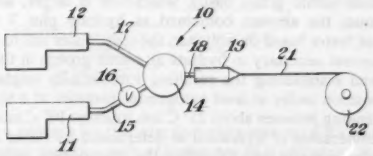
2. A single extruder provided with a hopper at one end and a restricted nozzle at the opposite end and two press-screws arranged coaxially in one another within an outer jacket, each of said screws being provided with a male thread for feeding in the direction of said nozzle, said male threads extending into an outer annular space between said jacket and the outer press-screw and extending into an inner annular space between said two press-screws, said threads being oppositely oriented, means to rotate the outer of said two press-screws and means to maintain the inner of said two press-screws stationary, said outer press-screw being provided with window-like openings communicating with said inner press-screw in the area of said hopper and separate feed means in said hopper to separately feed to the area between said outer jacket and said outer press-screw and to the area between said outer press-screw and said inner press-screw through said window-like openings, whereby said material being conveyed by said outer press-screw and said material being conveyed by said inner press-screw are substantially equal and conveyed at substantially the same rate by rotation of the outer press-screw, the improvement consisting in that said restricted nozzle is provided with two channels having a predetermined outlet cross-section with the outer channel at the inlet completely encompassing the inner channel, said outer channel at the inlet being fed from said outer press-screw and said inner channel at the inlet being fed from said inner screw, the outlet cross-section of said inner channel being other than circular, whereby the outer edge of said inner channel cross-section at the outlet is coextensive with the other channel cross-section.

4,094,947

MULTILAYER COEXTRUSION PROCESS FOR PRODUCING SELECTIVE REFLECTIVITY

Turner Alfrey, Jr., Midland, and Walter J. Schrenk, Bay City, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 3, 1976, Ser. No. 720,481
Int. Cl.[2] B29F 3/06
U.S. Cl. 264—171 3 Claims



1. In a method for the preparation of a plastic film or sheet composed of a plurality of generally parallel layers, the parallel layers being generally parallel to the major surfaces of the film or sheet, the film being composed of at least two diverse synthetic resinous materials arranged in layers in such a manner that selective reflectivity is obtained in the ultraviolet, infrared or visible region of the electromagnetic radiation spectrum, the steps of the method comprising providing at least a first stream and a second stream of heat-plastified extrudable thermoplastic material, dividing the first stream into a plurality of first substreams and the second stream into a plurality of second substreams, combining at least a major portion of the substreams to form a composite stream having at least a major portion of the first substreams and the second substreams interdigitated

deforming the composite stream to a generally sheet-like configuration wherein the interfaces between the substreams are generally parallel to the major surfaces of the sheet-like configuration and at least one external surface of the substream being composed of material of the first stream, the number and thickness of the substreams being sufficient to provide a film or sheet having said reflectivity characteristics after cooling below the thermoplastic temperature,

the improvement which comprises varying the reflectivity of the film or sheet by varying the quantity of material supplied to the combining of first and second substreams and a first substream forming an external surface of the sheet, the quantity of material provided for the first and second streams being maintained generally constant to thereby provide bands of apparent reflectivity extending laterally across the film or sheet.

4,094,948

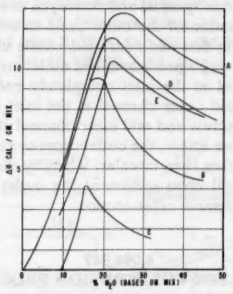
IMPROVED ACRYLONITRILE POLYMER SPINNING PROCESS

Robert Alan Blickenstaff, Charlottesville, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 294,184, Oct. 2, 1972, Pat. No. 3,984,601, which is a continuation-in-part of Ser. No. 189,202, Oct. 14, 1971, abandoned. This application Jun. 4, 1976, Ser. No. 692,936

Int. Cl.[2] D01F *6/18*

U.S. Cl. 264—206 **2 Claims**



1. Process for spinning fibers of an acrylonitrile polymer which comprises adding water to an acrylonitrile polymer that contains at least about 40 weight percent units of acrylonitrile, in an amount equivalent as a minimum to either 45% of that required to hydrate all the nitrile groups or 80% of that required to hydrate the coupled nitrile groups (on a 1/1 water molecule/nitrile group basis), whichever is larger, and as a maximum the amount combined as hydrate plus 7 weight percent water based on polymer, the total water not to exceed the amount necessary to hydrate all nitrile groups in the polymer and maintaining the resulting substantially single phase composition under at least autogenous pressure at a temperature ranging between about 25° C less to about 10° C more than the temperature of hydration as determined by Laser Raman Spectroscopy and then extruding the composition under pressure through an extrusion orifice to obtain acrylonitrile polymer filaments.

4,094,949

METHOD FOR PREPARING SHAPED ARTICLES OF A FLUORINATED ELASTOMER

Kiyoshi Yokokawa, and Noboru Shimamoto, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co. Ltd., Tokyo, Japan

Filed May 28, 1976, Ser. No. 690,971

Claims priority, application Japan, Jun. 9, 1975, 50-69303

Int. Cl.[2] C08F *29/22*

U.S. Cl. 264—234 **9 Claims**

1. A method for preparing a heat-shrinkable article from a resin blend of a fluorinated elastomer and a poly(vinylidene fluoride) resin which comprises the steps of

(a) mixing from 50 to 200 parts by weight of the poly(vinylidene fluoride) resin with 100 parts by weight of the fluorinated elastomer at a temperature between the melting temperature of the poly(vinylidene fluoride) resin and the decomposition temperature of the same resin to form the resin blend,

(b) adding a curing catalyst to the thus formed resin blend,

(c) shaping the resin blend into an article,

(d) heating the article under forced deformation at a temperature not lower than the melting temperature of the resin to effect curing, and

(e) cooling the article as such to a temperature below 100° C at which the deforming force is released.

4,094,950

METHOD AND APPARATUS FOR FORMING A SOLE ON AN UPPER BY DIP-COATING

Frederick Oldham, Pinetown, South Africa, assignor to Robert Tilden Clark, Brighton Beach, South Africa

Filed May 3, 1977, Ser. No. 793,422

Claims priority, application South Africa, May 6, 1976, 76/2707

Int. Cl.[2] B29C *13/00, 5/00*

U.S. Cl. 264—259 **7 Claims**

1. In a method for making an article of footwear having an upper and a sole unit comprising a sole region and a heel, including dipping a last in a fluid plastics material and hardening said plastics material about said last, the improvement comprising:

supporting an element spaced from a sole portion of said last during said dipping so that said last and said element are immersed in said plastics material and said plastics material flows between said last and said mold element; and

retaining said material between said element and said last to form at least a part of said sole unit of said article.

4,094,951

COMPOSITES OF OXIDIZED GRAPHITE MATERIAL AND EXPANDED GRAPHITE MATERIAL

Toshikatsu Ishikawa, Tokyo; Toyonosuke Kanemaru, Zushi; Haruo Teranishi, Machida, and Kazumasa Onishi, Yokohama, all of Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1976, Ser. No. 668,112

Int. Cl.[2] B29C *3/00*

U.S. Cl. 264—325 **5 Claims**

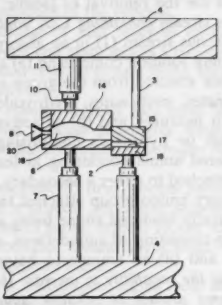
1. A process for producing a composite graphite material in a molded form having high density, high tensile strength and impermeability, characterized by incorporating expanded graphite material with oxidized graphite material in amounts of 1 - 60% by weight of expanded graphite material to form a mixture and then compression molding the resulting mixture.

4,094,952

METHOD OF MOLDING POLYMERIC MATERIAL

Alan I. W. Frank, Pittsburgh, Pa., assignor to Alan I. W. Frank Corporation, Exton, Pa.

Continuation-in-part of Ser. No. 539,483, Jan. 8, 1975, abandoned. This application Jun. 10, 1976, Ser. No. 694,597
Int. Cl.[2] B29F 1/06
U.S. Cl. 264—328 2 Claims



1. A method for producing a molded polymeric product having a utility body with an attached longitudinal handle having anisotropic properties in a mold having a variable cavity defining said utility body and part of said handle and a fixed mold adapted for communication with the variable mold and defining in part said longitudinal handle, said method comprising

a. introducing into said variable mold cavity when said variable mold is not in communication with said fixed mold an amount of polymeric material at least sufficient to form said product, said material being heated at least as early as the introduction into the cavity;

b. reducing the volume of the variable cavity and substantially simultaneously therewith, placing said variable and fixed cavities in communication to

(i) define said utility body of the product and said handle and

(ii) flow at least a sufficient amount of material longitudinally from the variable cavity into the fixed cavity; and

c. cooling the polymeric material while reducing the volume of the variable mold cavity whereby at least a portion of the handle includes a greater stiffness along the longitudinal direction than in any other direction.

4,094,953

PROCESS FOR RECOVERING MOLYBDENUM-99 FROM A MATRIX CONTAINING NEUTRON IRRADIATED FISSIONABLE MATERIALS AND FISSION PRODUCTS

Ali Sameh Abdel Hadi, Ettlinger-Schluttenbach; Johann Reinhardt, Eggenstein-Leopoldshafen, and Jutta Knapp, Karlsruhe, all of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Mar. 14, 1977, Ser. No. 777,627
Claims priority, application Germany, Mar. 16, 1976, 2610948
Int. Cl.[2] C01G 32/00; B01J 1/08
U.S. Cl. 423—2 18 Claims

1. Process for recovering molybdenum-99 from a matrix which has been irradiated with neutrons and contains fissionable materials and fission products, wherein the matrix is decomposed in an aqueous alkali hydroxide solution and the molybdenum-99 and part of the fission products are dissolved, the solution containing the molybdenum-99 is separated from a residue of particles containing at least actinides and lanthanides and is treated with thiocyanate ions to form a molybdenum complex comprising the steps of:

(a) conditioning the alkali solution containing molybdenum in the form of molybdate (MoO_4^{--}) with an iodine reduction agent in a quantity corresponding to a concentration range between 10^{-4} Mol and 0.2 Mol per liter alkali solution;

(b) adding mineral acid to the alkali solution until a hydronium ion concentration in the range from 0.1 to 6 Mol/l has been reached;

(c) reducing the molybdenum contained in the acidified solution of step b) to form a three-valent molybdenum Mo(III) and complexing the Mo(III) with SCN^- ions to form $[Mo(SCN)_6]^{3-}$ ions, said SCN^- ions being present in an ion concentration in the range between 0.1 Mol/l and 3 Mol/l of the solution being subjected to the reduction;

(d) treating the $[Mo(SCN)_6]^{3-}$ ion containing acid solution from step (c) with a previously conditioned, organic ion exchanger of the type of a chelate forming synthetic resin on the basis of a styrene divinyl benzene copolymer containing methylene nitrilo diacetate groups as functional groups and having a particle size in the range between 35μ and 840μ for selectively sorping the molybdenum;

(e) separating the ion exchanger from step (d), which is charged with molybdenum, from the solution now free of molybdenum;

(f) washing the separated molybdenum charged ion exchanger with a wash solution of diluted mineral acid containing a weak concentration of an iodine reduction agent, the quantity of the wash solution corresponding to 5 to 10 times the volume of the quantity of ion exchanger employed, in order to remove residual quantities of the molybdenum free solution;

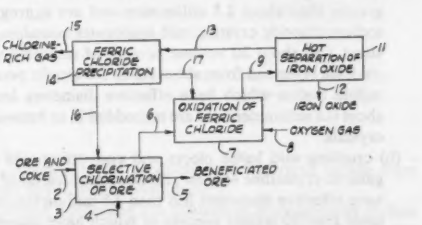
(g) eluting the molybdenum from the washed ion exchanger with a liquor at an elution temperature in the range from about 20° C to about 70° C.

4,094,954

OXIDATION OF FERRIC CHLORIDE FROM SELECTIVE CHLORINATION OF TITANIFEROUS MATERIAL

James Paul Bonsack, Aberdeen, and George R. Walker, Severna Park, both of Md., assignors to SCM Corporation, New York, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,791
Int. Cl.[2] C01G 49/06, 23/04; C22B 1/08
U.S. Cl. 423—69 2 Claims



1. In a process for the selective chlorination of a volume of titaniferous material with chlorine gas in a chlorination zone under selective chlorination conditions wherein ferric chloride vapors are produced as a chlorination product and ferric chloride is oxidized with molecular oxygen in a ferric chloride oxidation zone under ferric chloride oxidizing conditions to obtain solid byproduct iron oxide and chlorine gas, the improvement for recovery of chlorine gas which comprises:

in said oxidizing zone which is a single oxidizing zone oxidizing between about 40% and 80% of the ferric chloride present therein;

venting from said oxidizing zone a stream containing unreacted ferric chloride vapor and chlorine gas;

converting unreacted ferric chloride vapor in said stream into solid state particles;

separating said particles from said stream; and

passing at least a portion of said particles into said chlorina-

tion zone, said particles being volatilized in the chlorination zone for absorbing heat generated therein and for oxidation in single oxidation zone.

4,094,955

ACID PROCESS FOR RECOVERY OF ALUMINA FROM CLAY

Donald J. Bauer; Judith A. Eisele, and Barlane R. Eichbaum, all of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jun. 24, 1977, Ser. No. 809,882
Int. Cl.[2] C01F *7/66, 7/24*
U.S. Cl. 423—123 **1 Claim**

1. A method for production of alumina monohydrate comprising:

forming an aqueous leach solution of aluminum nitrate by leaching calcined clay with nitric acid,

treating the leach solution to remove iron impurity,

subjecting the iron-free aluminum nitrate solution to a pressure hydrolysis treatment at a temperature of about 250° to 350° C and a pressure of about 500 to 2500 psig for a time sufficient to convert a major proportion of the nitrate to monohydrate,

discharging the volatiles and heat resulting from the pressure hydrolysis treatment into a chamber containing calcined clay and water, whereby the calcined clay is leached to produce an aqueous leach solution of aluminum nitrate.

4,094,956

METHOD OF REDUCING THE SODIUM SULFATE CONTENT OF HALITE

Barrie H. Bieler, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 12, 1977, Ser. No. 824,006
Int. Cl.[2] C01D *3/04, 3/14, 5/00*
U.S. Cl. 423—179 **10 Claims**

1. The method of reducing the sulfate content of a halite, which comprises:

(a) providing pieces of halite which have effective diameters greater than about 2.5 millimeters and are aggregates of sodium chloride crystals, said aggregates containing from about 1 to about 20 volume percent of saturated sodium chloride brine and from about 0.5 to 5.0 weight percent of sulfate bodies which have effective diameters less than about 0.5 millimeters and are embedded in or between said crystals,

(b) crushing said halite pieces and converting said aggregates to crystalline sodium chloride particles, all of which have effective diameters less than 2.5 millimeters and not more than 30 weight percent of which have diameters of less than 0.4 millimeters, thereby exposing a major proportion of said sulfate bodies,

(c) attrition-washing said particles by agitating them with a washing brine which is about 80% or more saturated with sodium chloride and contains less than an amount of sulfate as specified below, said agitation being of such character and intensity that said particles make contact with each other and, as a consequence, a major proportion of said exposed bodies are dislodged from said surfaces,

(d) separating those sodium chloride particles larger than 0.5 millimeter in effective diameter from said brine, and from the dislodged sulfate bodies, the dissolved sulfate content of said washing brine and the amount thereof retained on said larger particles, after said separation, being controlled so that the amount of sulfates added to said particles by the retained washing brine is about 0.05 weight percent or less of their sodium chloride content.

4,094,957

PROCESS FOR REMOVING ACID GASES WITH HINDERED AMINES AND AMINO ACIDS

Guido Sartori, Linden, and David W. Savage, Summit, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Dec. 14, 1976, Ser. No. 750,520
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—223 **24 Claims**

1. A process for the removal of [acidic components] CO_2 from a gaseous stream *containing* CO_2 which comprises contacting said gaseous stream (1) in an absorption step with an aqueous absorbing solution comprising (a) a basic alkali metal salt or hydroxide selected from the group consisting of alkali metal bicarbonates, carbonates, hydroxides, borates, phosphates and their mixtures, and (b) an activator for said basic alkali metal salt or hydroxide comprising (i) at least one sterically hindered amine containing at least one secondary amino group attached to either a secondary or tertiary carbon atom or a primary amino group attached to a tertiary carbon atom, said sterically hindered amine being a member selected from the group consisting of aminoethers, aminoalcohols, di- and triamines, and (ii) an aminoacid having 4 to 8 carbon atoms *which has the capability to increase the solubility of said sterically hindered amines in alkaline aqueous conditions at elevated temperatures;* and (2) in a desorption and regeneration step desorbing at least a portion of the absorbed [acidic components] CO_2 from said absorbing solution.

4,094,958

PROCESS FOR THE SEPARATION OF NH_3 FROM A GASEOUS MIXTURE CONTAINING NH_3 AND HCN

Ralph Miller, Pleasantville, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 5, 1977, Ser. No. 784,771
Int. Cl.[2] C01C *3/00*
U.S. Cl. 423—238 **8 Claims**

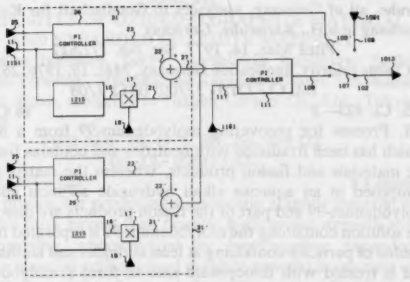
1. A process for the separation of ammonia from a gaseous mixture containing ammonia and hydrogen cyanide which comprises contacting said gaseous mixture in an absorption stage with an absorbent liquor comprising an acidified ammonium nitrate solution thereby selectively absorbing ammonia from said gaseous mixture and forming a solution of diminished acidity, adding nitric acid to the ammonium nitrate-containing solution of diminished acidity to restore its acidity to its initial level and recycling said restored solution to said absorption stage, said nitric acid being present in the liquid and vapor phase of said ammonium nitrate-containing solution in an amount sufficient to inhibit azulmic acid formation.

4,094,959

PROCESS MEASUREMENT AND CONTROL

Donald H. Ball; Robert W. Rutledge, and James D. Voelkers, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1977, Ser. No. 764,926
Int. Cl.[2] C01C *1/04;* G06F *15/18, 15/46;* G06G *7/58*
U.S. Cl. 423—359 **23 Claims**



15. A process for the production of ammonia comprising:

a. introducing a fresh feed stream resulting from a first feed stream from a hydrogen source and a second feed stream from a nitrogen source into a reaction zone, said fresh feed stream being a portion of a total feed stream being introduced into said reaction zone,
b. reacting said total feed stream in said reaction zone to convert hydrogen and nitrogen to ammonia and to generate a hydrogen, nitrogen and ammonia-comprising reaction effluent,
c. separating an ammonia product stream from said reaction effluent as the product of the process,
d. recycling a portion of said reaction effluent comprising hydrogen, nitrogen and ammonia as a recycle stream to said reaction zone, said recycle stream being another portion of said total feed stream,
e. measuring the composition of said total feed stream and generating a first process parameter measurement signal representative of the hydrogen to nitrogen ratio of said feed stream,
f. generating in response to first process parameter measurement signal and a process parameter setpoint signal a first intermediate control signal related to the deviation of said first process parameter measurement singal from said process parameter setpoint signal,
g. generating a first transformed signal from said first process parameter measurement signal which is related thereto by the relationship:

$$PP_1 = \frac{k_{41}S}{(1 + c_1S)\ (1 + c_2S) \ldots (1 + c_nS)} \cdot MP_1$$

wherein
MP_1 is said first process parameter measurement signal,
PP_1 is said transformed signal,
S is the Laplace transform operator (d/dt),
k_{41} is a constant not equal to 0,
$c_1, c_2 \ldots c_n$ are constants not equal to 0,
n is an integer of at least 2,
h. combining said first intermediate control signal and said first transformed signal to generate a first process variable signal constituting the weighted sum or difference of the first intermediate control signal and the transformed signal.
i. controlling the relative size of said first feed stream from said hydrogen source and said second feed stream from said nitrogen source in response to said first process variable signal.

4,094,960

PROCESS FOR PRODUCTION OF CARBON BLACK

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 4, 1976, Ser. No. 663,891
Int. Cl.[2] C01B *31/02*; C09C *1/48*
U.S. Cl. 423—456 **5 Claims**

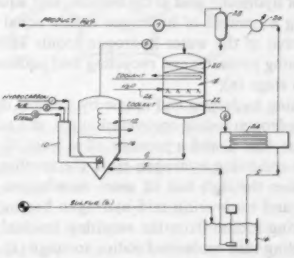
1. A process for producing carbon black having a tint of about 113 or higher and a structure of about 117 or higher comprising:
(A) introducing a normally liquid hydrocarbon feedstock into a carbon black reactor essentially in axial direction along the reactor axis, said carbon black reactor comprising:
a. an upstream confining wall,
b. a downstream confining wall,
c. a tubular confining wall between said upstream and said downstream confining wall, which tubular confining wall comprises
aa. connected to said upstream confining wall a longitudinal tubular axial section, at least the downstream portion thereof having essentially triangular cross-section and confining an axial zone,
bb. in open communication and axial alignment with and operatively connected to said axial section a vortex section having an essentially plane upstream wall and connected to said essentially plane upstream wall a cylindrical wall confining a vortex zone, said cylindrical wall having an internal diameter that is larger than the diameter of a circle inscribed into the triangle cross-section of said axial zone, said axial zone opening through said essentially plane upstream wall into said vortex zone,
cc. in open communication and axial alignment with and operatively connected to said vortex section a reaction section confining a reaction zone,
d. first conduit means for the introduction of hydrocarbon feedstock along the reactor axis into the axial zone,
e. vortex generating means for generating a vortex of hot combustion gases in said vortex zone, and
f. second conduit means for the withdrawal of carbon black-containing smoke from the reactor,
(B) generating a vortex of hot combustion gases in said vortex zone close to said cylindrical wall and close to said plane upstream wall,
(C) introducing a stream of essentially oxygen-free gas into said axial zone,
(D) contacting said hydrocarbon feedstock with said hot combustion gases in said reactor to produce a reaction admixture and to pyrolytically decompose said hydrocarbon feed to form carbon black,
(E) passing said reaction admixture through said reaction zone to said downstream confining wall, and
(F) withdrawing a carbon black-containing smoke via said second conduit means from said carbon black reactor.

4,094,961

HYDROGEN SULFIDE PRODUCTION

David K. Beavon, Pasadena, Calif., assignor to Ralph M. Parsons Company, Pasadena, Calif.

Filed Nov. 7, 1974, Ser. No. 521,831
Int. Cl.[2] C01B *17/16*
U.S. Cl. 423—564 **13 Claims**



1. A process for the production of hydrogen sulfide from elemental sulfur which comprises:
(a) forming a reducing gas containing hydrogen and carbon monoxide by combustion of a carbonaceous fuel in the presence of an amount of oxygen insufficient for complete oxidation of the carbonaceous fuel;
(b) passing the reducing gas through a sulfur vaporization zone containing molten sulfur to simultaneously cool the reducing gas and vaporize sulfur while further cooling the sulfur vaporization zone to provide a resultant gaseous mixture containing hydrogen, carbon monoxide and sulfur vaporized by the reducing gas in which the mole ratio of the sum of the hydrogen and carbon monoxide to vaporized sulfur, calculated as S_1, in the resultant gas stream is at least approximately 1.15; and
(c) combining the resultant gaseous mixture with water in an amount sufficient to form a mixture having a water vapor content of at least 10 mole percent in a catalytic conversion zone wherein the sulfur is essentially completey hydrogenated to hydrogen sulfide at a temperature maintained from about 500 to about 800° F by reaction with the

hydrogen present in the reducing gas and hydrogen formed by the reaction of water with the carbon monoxide present in the reducing gas in the presence of a catalyst consisting of at least one supported metal selected from Group Va, VIa, and VIII and the Rare Earth Series of the Periodic Table.

4,094,962

PROCESS FOR PRODUCING HYDROGEN AND SULFUR FROM HYDROGEN SULFIDE

Gioacchino Cocuzza, Catania, and Giuseppe Musso, Osmate (Varese), both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Apr. 1, 1977, Ser. No. 783,597
Int. Cl.[2] C01B *17/04, 17/06, 1/05*
U.S. Cl. 423—573 R 12 Claims

1. A process for producing hydrogen and sulfur from hydrogen sulfide, which comprises:

(a) contacting hydrogen sulfide and iodine in a molar excess of said hydrogen sulfide with respect to said iodine, in an aqueous solution of hydriodic acid containing from 50 to about 20% by weight of hydrogen iodide, at a temperature of from 10° to 80° C and at a pressure equal to or higher than atmospheric, thereby to convert said iodine into hydrogen iodide and form sulphur by reaction between said iodine and hydrogen sulfide, the amount of iodine being such as to obtain an aqueous suspension of sulphur, containing in dissolved form unreacted hydrogen sulfide, having a content of hydrogen iodide not exceeding 50% by weight;

(b) recovering said sulphur from said suspension;

(c) desorbing hydrogen sulfide from the resulting solution and recycling said desorbed hydrogen sulfide to stage (a);

(d) rectifying in a distillation column the residual solution obtained in (c), at superatmospheric pressure, thereby to recover hydrogen iodide at the top and an aqueous solution of hydriodic acid at the bottom, said aqueous solution having a content of hydrogen iodide equal to or higher than that of the water-hydrogen iodide azeotrope at the operating pressure, and recycling said aqueous solution of (d) to stage (a);

(e) forming hydrogen and iodine by thermal dissociation of the hydrogen iodide recovered in (d), at a temperature of at least 400° C and a pressure of at least 10 atmospheres, while removing hydrogen from the resulting mixture by diffusion through one or more membranes of palladium alloy and recovering said hydrogen having diffused, recovering iodine from the resulting residual mixture and recycling said recovered iodine to stage (a).

4,094,963

MEANS FOR TESTING FOR PREGNANCY

Brij B. Saxena, Englewood, N.J., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 522,760, Nov. 11, 1974, Pat. No. 4,016,250, which is a continuation-in-part of Ser. No. 454,145, Mar. 22, 1974, abandoned. This application May 20, 1976, Ser. No. 688,277
The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.
Int. Cl.[2] A61K *43/00, 39/00*
U.S. Cl. 424—1 5 Claims

1. Means for the determination of human chorionic gonadotropin (HCG), luteinizing hormone (LH) or HCG-like material in an aqueous sample, comprising

(a) a container having therein a first reagent ; and

(b) a separate second container having therein a second reagent;

(c) said first reagent comprising in substantially pure form the specific fraction of plasma membrane extract from the corpus luteum of a species having the receptor for human chorionic gonadotropin capable of selectively binding biologically active human chorionic gonadotropin; and

(d) said second reagent comprising labeled human chorionic gonadotropin capable of emitting radiation, said first reagent being intended to be contacted with the sample containing the hormone to be measured and with the second reagent to bind part of the labeled and unlabeled hormone to said receptor

the emitted radiation therefrom being a function of the concentration of the hormone in the aqueous sample.

4,094,964

CLONIDINE ASSAY

Bevyn Jarrott, Nutley, and Sidney Spector, Livingston, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed May 10, 1977, Ser. No. 795,576
Int. Cl.[2] G01N *33/16;* A61K *43/00;* C07G *7/00;* A61K *39/00*
U.S. Cl. 424—1 8 Claims

6. A method for the assay of clonidine in a sample, which method comprises mixing said sample with a known amount of labelled clonidine and an antibody which will selectively complex with clonidine, measuring the degree of binding of said labelled clonidine compound with said antibody, and determining the amount of clonidine present in said sample by comparing said degree of binding to a standard curve obtained by mixing known amount of clonidine with fixed amounts of said labelled clonidine and said antibody and determining the degree of binding for each known amount of clonidine.

4,094,965

DIAGNOSTIC AGENTS CONTAINING ALBUMIN AND METHOD FOR MAKING SAME

Warren W. Layne, Boston, and Eugene L. Saklad, Sudbury, both of Mass., assignors to New England Nuclear Corporation, Boston, Mass.

Filed Apr. 1, 1977, Ser. No. 783,673
Int. Cl.[2] A61K *29/00, 43/00*
U.S. Cl. 424—1.5 29 Claims

23. A method of concentrating technetium-99m in vivo in a target tissue of a mammal comprising intravenously administering to the mammal a radioactive composition comprising a mixture of technetium-99m, a reducing agent and delipidized serum albumin.

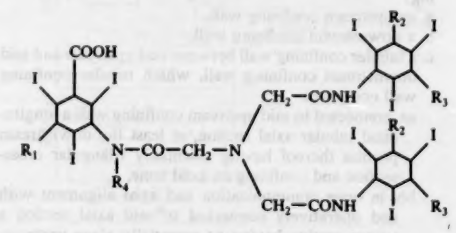
4,094,966

IODOBENZENE DERIVATIVES AND X-RAY CONTRAST MEDIA CONTAINING THE SAME

Guy Tilly; Michel Jean Charles Hardouin, and Jean Lautrou, all of Aulnay-sous-Bois, France, assignors to Laboratoires Andre Guerbet, Aulnay-sous-Bois, France

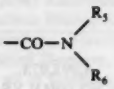
Division of Ser. No. 579,279, May 20, 1975, Pat. No. 4,014,986. This application Dec. 7, 1976, Ser. No. 748,323
Claims priority, application United Kingdom, May 31, 1974, 24169/74; Jul. 31, 1974, 33900/74
Int. Cl.[2] A61K *29/02;* C07C *101/68*
U.S. Cl. 424—5 7 Claims

1. An iodobenzene derivative selected from the group consisting of a compound of formula

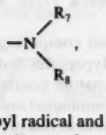


in which:

R_1 is selected from the group consisting of hydrogen, a radical having the formula

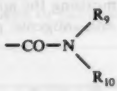


R_5 and R_6 being selected from the group consisting of hydrogen, lower alkyl and lower hydroxy alkyl, and a radical of the formula



R_7 being a lower alkanoyl radical and R_8 being selected from the group consisting of hydrogen, lower alkyl and lower hydroxylakyl,

R_2 is selected from the group consisting of hydrogen, a radical having the formula



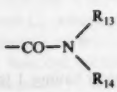
in which

R_9 and R_{10} have the meanings given for R_5 and R_6, and a radical of the formula

in which

R_{11} has the meaning given for R_7 or represents a hydrogen atom and R_{12} has the meaning given for R_8,

R_3 is selected from the group consisting of hydrogen, a radical having the formula



in which

R_{13} and R_{14} have the meanings given for R_5 and R_6, and a radical of the formula

in which

R_{15} has the meaning given for R_7 or represents hydrogen and R_{16} has the meaning given for R_8,

R_4 is selected from the group consisting of hydrogen, lower alkyl and lower hydroxylakyl, a lower alkyl ester thereof and a salt with a pharmaceutically acceptable base.

5. An X-ray contrast mdium comprising an aqueous solution of an effective amount of a compound as claimed in claim 1.

4,094,967

IODINE-POLYVINYLPYRROLIDONE SOLID PRODUCT AND METHOD OF PREPARATION

Joseph G. Gilbert, Lighthouse Point, Fla., assignor to Allor Foundation, Boston, Mass.

Filed Oct. 22, 1976, Ser. No. 735,088
Int. Cl.[2] A01N *11/00*; A61K *31/79, 33/18*
U.S. Cl. 424—28 12 Claims

1. A method of making a polyvinylpyrrolidone-iodine composition in which the iodine is stored in solid form protected from light and air-exposure deterioration and is continuously releasable for active pharmacological use by application of at least one of heat and moisture, that comprises, preparing an alcohol or aqueous solution of finely powdered crystalline iodine; forming a solution of polyvinylpyrrolidone; admixing the iodine solution with the polyvinylpyrrolidone solution; adding cinnamic alcohol and thoroughly dispersing the same in the iodine solution-polyvinylpyrrolidone solution; and drying the solution to solid state.

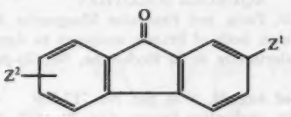
4,094,968

TREATMENT FOR ALLERGY AND METHOD OF COMPOSITION THEREOF

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 394,423, Sep. 5, 1973, Pat. No. 3,939,173.
This application Nov. 26, 1975, Ser. No. 635,768
Int. Cl.[2] A61K *9/14*; A61L *9/04*; A61K *31/41*
U.S. Cl. 424—46 30 Claims

1. A method of inhibiting the symptoms of asthma or allergic rhinitis in a mammal susceptible to asthma or allergic rhinitis which comprises the administration to said mammal of a prophylactically effective, non-toxic amount of a compound of formula (I)



(I)

wherein one of Z^1 and Z^2 is a 5-(1-R)tetrazolyl or a 5-(2-R) tetrazolyl group in which R is hydrogen or alkyl having 1 to 6 carbon atoms, and the other is selected from the group consisting of carboxy, 5-(1-R) tetrazolyl and 5-(2-R)tetrazolyl as defined, provided that when Z^2 is 5-(1-R)tetrazolyl or 5-(2-R)tetrazolyl then Z^1 is carboxy; and Z^2 is also selected from the group consisting of hydrogen, nitro, cyano, halogen, alkylsulphinyl and alkylsulphonyl, acyl, alkyl, or alkoxy wherein the "alkyl" moiety of each of the acyl, alkyl, alkoxy, alkylsulphinyl and alkylsulphonyl groups has 1 to 6 carbon atoms; together with salts, and, when Z^1 or Z^2 is carboxy, alkyl esters having 1 to 6 carbons and unsubstituted amides or amides substituted by one or two alkyl groups having 1 to 6 carbons of said compounds of formula (I).

4,094,969

PESTICIDE COMPOSITIONS STABILIZED WITH SULFONATED CATECHIN/LEUCOCYANIDIN COPOLYMER AND METHOD OF USING SAME

Othmer F. Batzer, Libertyville, Ill., and Carlo M. Ignoffo, Columbia, Mo., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 410,488, Oct. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,598, Mar. 15, 1971, abandoned. This application Jun. 16, 1975, Ser. No. 587,068
Int. Cl.[2] A61K *31/74*; A01N *15/00*
U.S. Cl. 424—78 24 Claims

1. An agricultural pesticidal composition comprising an agronomically acceptable carrier having dispersed therein a light-degradable agricultural pesticide selected from the group consisting of pyrethrin, allethrin, and microbial insecticides in

an amount sufficient to control a target pest and as a stabilizer for said pesticide a sunlight degradation retarding effective amount of a sulfonated copolymer selected from the group consisting of: (a) the products produced by sulfonating hemlock bark copolymers consisting essentially of catechin and leucocyanidin in a mol ratio of about 1:1 to a sulfonic acid content expressed as sulfur dioxide of 9.5 to 12 percent by weight of the total sulfonated copolymer, said sulfonated copolymer having a molecular weight in the range of about 3,000 to 6,000, and (b) non-phytotoxic metal and ammonium salts thereof.

4,094,970

ELASTOMERIC POLYURETHANE-BASED ARTICLES HAVING AN INSECTICIDAL DEPOT GAS ACTION

Wolfgang Behrenz, Overath-Steinenbrueck; Dietmar Schäpel, Cologne, and Manfred Dahm, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 12, 1976, Ser. No. 714,077
Claims priority, application Germany, Aug. 26, 1975, 2537894
Int. Cl.[2] A01N *9/36;* A61K *31/74*
U.S. Cl. 424—78 5 Claims

1. A solid insecticidal article comprising an insecticidally effective amount of at least one volatile phosphoric or thiophosphoric acid ester and about 1 to 10 times its weight of a solid elastomeric polyurethane carrier material formed from a polyisocyanate and units of a long chain polyol having a molecular weight of about 1,000 to 10,000, and of at least one of a short chain polyol and/or polyamine having a molecular weight of about 62 to 1,000, the weight ratio of units of long chain polyol to units of short chain polyol plus polyamine ranging from about 1:1 to 9:1.

4,094,971

IMMUNOLOGICAL ADJUVANT AGENTS ACTIVE IN AQUEOUS SOLUTION

Louis A. Chedid, Paris, and Francoise Marguerite Audibert, Neuilly-sur-Seine, both of France, assignors to Agence Nationale de Valorisation de la Recherche, Neuilly-sur-Seine, France

Filed Aug. 25, 1976, Ser. No. 717,509
Claims priority, application France, Aug. 29, 1975, 75 26704
Int. Cl.[2] A61K *39/02*
U.S. Cl. 424—92 40 Claims

1. A compound, a water-soluble adjuvant which has immunological activity in-vivo when administered to a host in an oil-free aqueous solution, which adjuvant is an acylated peptidoglycane fragment having saccharide units of N-acetylglucosamine and N-acylmuramyl, the acyl radical being glycolyl or acetyl, and the muramyl group having peptide chains linked thereto,

wherein the acyl groups of the peptidoglycane are of a physiologically acceptable polycarboxylic acid, or its anhydride, and the physiologically acceptable salts of the acylated compound.

4,094,972

PROSTAGLANDIN USE IN PROLONGING AND INTENSIFYING FERTILITY IN POULTRY

Bernard James Marquez, East Lansing, Mich., assignor to The Board of Trustees, Michigan State University, East Lansing, Mich.

Filed Aug. 4, 1977, Ser. No. 821,672
Int. Cl.[2] A61K *35/52, 31/215, 31/19*
U.S. Cl. 424—105 19 Claims

1. A mixture comprising

(1) neat poultry semen and

(2) a conventional poultry semen diluent containing per volume of said mixture to be inseminated into a hen, an amount of a poultry-fertility enhancing prostaglandin (POFEN-PG) effective to intensify or prolong fertility in an egg-laying hen into which said mixture is inseminated, said semen and diluent being combined in a ratio sufficiently large to ensure an adequate number of spermatozoa per volume of mixture of fertilization and sufficiently small to ensure easy and complete intermixing of semen and diluent.

4,094,973

MEDICAL PROTEIN HYDROLYSATE AND PROCESS OF USING THE SAME

Harry J. Robertson, Robertson Resource Ltd., Wesley Drive, Salisbury, Md. 21801

Continuation-in-part of Ser. No. 409,145, Oct. 24, 1973, abandoned. This application May 10, 1976, Ser. No. 685,050
Int. Cl.[2] A61K *37/18, 37/02, 35/12*
U.S. Cl. 424—177 16 Claims

1. A therapeutic agent comprising a non-antigenic, protein hydrolysate having polypeptides and amino acids derived by:

comminuting the immature poultry feet and washing them;

commingling said comminuted immature poultry feet with a dilute, mild organic acid at a pH between 6.5 and 3.6 at an elevated temperature up to 155° F;

removing the fat constituent; and

removing the solubilized protein and dissolved minerals at the elevated temperature.

11. The process of treating damaged higher animal tissue for therapeutic purposes comprising the applying to said tissue an effective amount of a non-antigenic protein hydrolysate as claimed in claim 1.

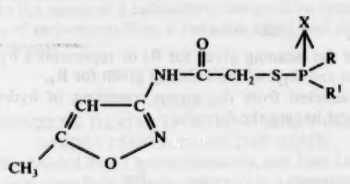
4,094,974

ISOXAZOLE PHOSPHATES AND PHOSPHONATES

Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 24, 1977, Ser. No. 771,716
Int. Cl.[2] C07D *261/14;* A01N *9/36*
U.S. Cl. 424—200 24 Claims

1. A compound having the formula



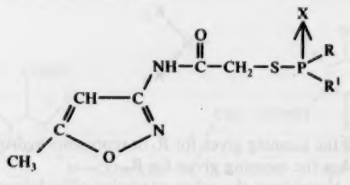
in which

R is alkyl or alkoxy each having 1 to 6 carbon atoms,

R^1 is alkoxy having 1 to 6 carbon atoms, and

X is oxygen or sulfur.

9. A method of controlling insects comprising applying to said insects or the habitat or feedstuff of said insects an insecticidally effective amount of a compound having the formula



in which

R is alkyl or alkoxy each having 1 to 6 carbon atoms,

R^1 is alkoxy having 1 to 6 carbon atoms, and

X is oxygen or sulfur.

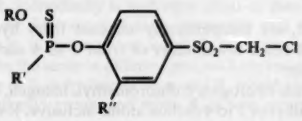
4,094,975

O-ALKYL-O-CHLOROMETHYLSULFONYLPHENYL-THIONOPHOSPHONIC ACID ESTERS AND NEMATICIDAL AND ARTHROPODICIDAL USE

Fritz Maurer; Hans-Jochem Riebel; Rolf Schroder, all of Wuppertal; Wilhelm Sirrenberg, Sprockhoevel; Ingeborg Hammann, Cologne; Bernhard Homeyer, Leverkusen, and Herbert Thomas, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 2, 1977, Ser. No. 764,798
Claims priority, application Germany, Feb. 13, 1976, 2605889
Int. Cl.[2] A01N *9/36*; C07F *9/18*
U.S. Cl. 424—216 10 Claims

1. An O-alkyl-O-(4-chloromethylsulfonylphenyl)thionophosphonic acid ester of the formula



in which

R represents alkyl with 1 to 6 carbon atoms,

R′ represents alkyl with 1 to 6 carbon atoms or phenyl, and

R″ represents hydrogen or halogen.

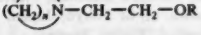
4,094,976

ANTICOCCIDIAL CYCLICAMINO ETHANOLS AND ESTERS THEREOF

Richard A. Dybas, Somerville; Donald W. Graham, Mountainside, and Jeannette E. Brown, Summit, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 586,006, Jun. 11, 1975, abandoned.
This application Dec. 29, 1976, Ser. No. 755,366
Int. Cl.[2] A61K *31/63, 31/65, 31/40*
U.S. Cl. 424—228 15 Claims

1. An anticoccidial composition comprising an anticoccidially effective amount of a cyclicamino ethanol compound of the formula:



wherein R is hydrogen or an acyl radical derived from a non-toxic carboxylic acid selected from the group consisting of C_{1-10} alkanoyl; substituted C_{1-5} alkanoyl wherein the substituent is halophenyl and diphenyl; carbocyclic alkanoyl containing up to 5 carbon atoms; benxoyl; nitrobenzoyl; nicotinyl, orotoyl; and C_{1-10} alkane dicarbonyl; wherein *n* is 3, 4 or 5 or a non-toxic acid addition salt thereof, in a chicken feed.

4,094,977

COMBINATION PREPARATION OF ESTROGEN AND PROSTAGLANDIN

Karl Seeger, Hofheim, Taunus, and Fritz Bauer, Bad Soden am Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 24, 1976, Ser. No. 699,262
Claims priority, application Germany, Jun. 26, 1975, 2528419
Int. Cl.[2] A61K *31/56, 31/215, 31/19*
U.S. Cl. 424—240 8 Claims

1. A leutolytically-active pharmaceutical composition comprising an injectable or orally-administrable carrier and, as the active ingredient, a combination of at least one luteolytically effective prostaglandin or a physiologically acceptable salt or ester thereof and at least one estrogen or an ester or ether thereof in a weight ratio from 1:1 to 1:5000.

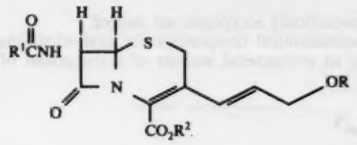
4,094,978

3-PROPENYL DERIVATIVES OF CEPHALOSPORIN, COMPOSITIONS AND THEIR USE

Philip J. Beeby, Melbourne, Australia, assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Jul. 29, 1976, Ser. No. 709,696
Int. Cl.[2] A61K *31/545*; C07D *501/24*
U.S. Cl. 424—246 36 Claims

1. A compound having the formula:

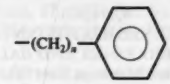


I

wherein

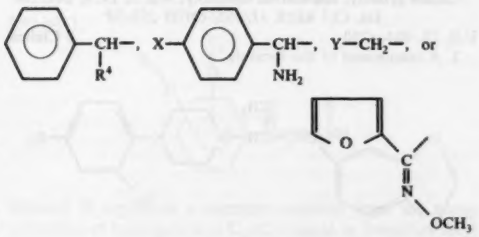
R is hydrogen or a group having the formula

in which R^3 is hydrogen, alkyl having one to six carbon atoms, or the group



in which *n* is 0 to 3, inclusive;

R^1 is a group having the formula



wherein R^4 is hydrogen, hydroxy or carboxy; X is hydrogen or hydroxy; Y is thiophen-2-yl, (1H)-tetrazol-1-yl, 4-pyridylthio, phenoxy or cyano;

R^2 is hydrogen or a protecting group selected from the group of benzhydryl, benzyl, o-nitrobenzyl, p-nitrobenzyl, 3,5-dinitrobenzyl, p-methoxybenzyl, tert-butyl, pivaloyloxymethyl, phenacyl and polyhaloalkyl having two to six carbon atoms; and the pharmaceutically acceptable salts thereof.

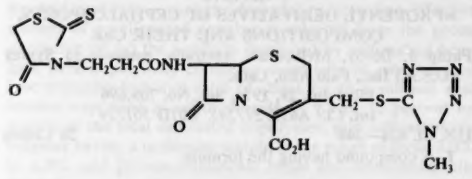
4,094,979

ORALLY ACTIVE CEPHALOSPORINS

Daniel M. Teller, Devon, and John H. Sellstedt, Pottstown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

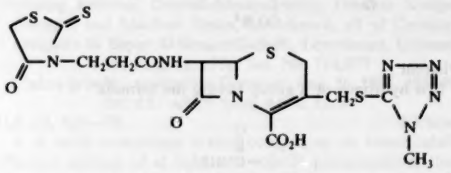
Filed Sep. 24, 1976, Ser. No. 726,709
Int. Cl.[2] C07D *501/36*; A61K *31/545*
U.S. Cl. 424—246 7 Claims

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof.

7. A pharmaceutical composition for oral administration comprising an antibacterial amount of a compound of the formula:



or a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable non-toxic diluent therefor.

4,094,980

N-[1-(3',4'-METHYLENEDIOXY-PHENYL)-PROPYL-(2)]-N'-PHENYL-PIPERAZINES AND SALTS THEREOF

Ernst-Otto Renth; Anton Mentrup; Kurt Schromm, and Wilhelm Frölke, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

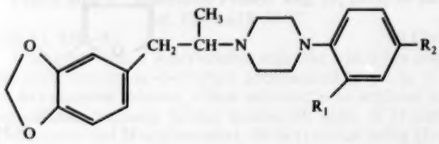
Continuation-in-part of Ser. No. 608,455, Aug. 28, 1975, abandoned. This application Dec. 10, 1976, Ser. No. 749,344

Claims priority, application Germany, Sep. 3, 1974, 2442158

Int. Cl.[2] A61K *31/495;* **C07D** *295/08*

U.S. Cl. 424—250 **5 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are chlorine, or

R_1 is methyl and R_2 is methoxy,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4. A pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective anti-hyperlipidemic or anti-hypercholesteremic amount of a compound of claim 1.

4,094,981

SMOOTH MUSCLE RELAXANT EMPLOYING 10-IMIDOYLACRIDANS

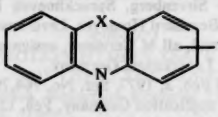
Yao Hua Wu, and Walter G. Lobeck, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 670,600, Mar. 26, 1976, Pat. No. 4,046,891, which is a division of Ser. No. 561,462, Mar. 24, 1975, Pat. No. 3,962,252, which is a division of Ser. No. 336,671, Feb. 28, 1973, Pat. No. 3,888,852. This application Jul. 1, 1977, Ser. No. 812,292

Int. Cl.[2] A61K *31/47*

U.S. Cl. 424—257 **8 Claims**

1. The process for producing a smooth muscle relaxant effect in a mammal which comprises administering thereto a non-toxic dose of from about 0.01 to 10 mg./kg. of body weight of said mammal of a compound selected from the group consisting of 10-imidoylacridans having the formula



and a non-toxic pharmaceutically acceptable acid addition salt thereof wherein

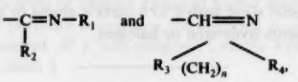
X represents a divalent methylene radical of the formula $-C(Z_1Z_2)-$

wherein

Z_1 and Z_2 are independently selected from hydrogen or straight chain lower alkyl of from 1 to 4 carbon atoms inclusive;

Y represents hydrogen, trifluoromethyl, halogen, dihalogen, lower alkyl of 1 to 4 carbon atoms inclusive, lower alkoxy of 1 to 4 carbon atoms inclusive; and

A is selected from the group consisting of



wherein

R_1 is lower alkyl of 1 to 4 carbon atoms inclusive or cycloalkyl of 3 to 6 carbon atoms inclusive;

R_2 is hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

R_3 and R_4 are independent members selected from the group consisting of hydrogen or lower alkyl of 1 to 4 carbon atoms inclusive;

n is an integer of 3 to 5.

4,094,982

PYRIDINE SULFONAMIDES AND THEIR USE AS ANTICOCCIDIAL AGENTS

Yasuhiro Morisawa; Mitsuru Kataoka; Noritoshi Kitano, and Toshiaki Mastuzawa, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

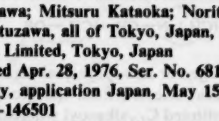
Filed Apr. 28, 1976, Ser. No. 681,154

Claims priority, application Japan, May 15, 1975, 50-58180; Dec. 9, 1975, 50-146501

Int. Cl.[2] C07D *213/02;* **A01N** *9/22*

U.S. Cl. 424—263 **60 Claims**

1. A compound having the formula



wherein

R_1 represents hydrogen atom, amino group or a group

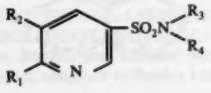
in which R_5 and R_6 may be the same or different and each represents an alkyl group of 1 to 4 carbon atoms or R_5 is hydrogen atom and R_6 represents an alkyl group of 1 to 4 carbon atoms, an alkenyl group of 3 or 4 carbon atoms or a benzyl group optionally substituted with halogen, cyano, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R_2 represents nitro group or an alkylamino group of 1 to 3 carbon atoms;

R_3 and R_4 individually represent hydrogen atom, an alkyl group of 1 to 4 carbon atoms, an alkoxyalkyl group which has 1 to 4 carbon atoms in the alkoxy moiety and 2 to 4 carbon atoms in the alkyl moiety, an alkenyl group of 3 or 4 carbon atoms, an alkanoyl group of 1 to 18 carbon atoms or a benzyl group optionally substituted with halogen, cyano, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; provided that when R_1 is hydrogen atom and R_2 is nitro group, R_3 and R_4 may be the same or different and each represents said alkyl group or said alkoxyalkyl group or R_3 is hydrogen atom and R_4 is hydrogen atom, said alkyl group, said alkoxyalkyl group, said alkenyl group, said alkanoyl group or said benzyl group, when R_1 is hydrogen atom and R_2 is said alkylamino group, R_3 and R_4 individually is hydrogen atom or they may be the same or different and each represents said alkyl group, when R_1 is amino group and R_2 is nitro group, R_3 and R_4 may be the same or different and each represents said alkyl group or R_3 is hydrogen atom and R_4 is said alkyl group or said alkenyl group, and when R_1 is said group

and R_2 is nitro group, R_3 and R_4 are the same as defined above with respect to the R_5 and R_6.

37. An anticoccidal composition containing an amount, sufficient to inhibit coccidiosis, of a compound having the formula



intimately mixed with an inert carrier, wherein

R_1 represents hydrogen atom, amino group or a group

in which R_5 and R_6 may be the same or different and each represents an alkyl group of 1 to 4 carbon atoms or R_5 is hydrogen atom and R_6 represents an alkyl group of 1 to 4 carbon atoms, an alkenyl group of 3 or 4 carbon atoms or a benzyl group optionally substituted with halogen, cyano, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R_2 represents nitro group or an alkylamino group of 1 to 3 carbon atoms;

R_3 and R_4 individually represent hydrogen atom, an alkyl group of 1 to 4 carbon atoms, an alkoxyalkyl group which has 1 to 4 carbon atoms in the alkoxy moiety and 2 to 4 carbon atoms in the alkyl moiety, an alkenyl group of 3 or 4 carbon atoms, an alkanoyl group of 1 to 18 carbon atoms or a benzyl group optionally substituted with halogen, cyano, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms; provided that when R_1 is hydrogen atom and R_2 is nitro group, R_3 and R_4 may be the same or different and each represents said alkyl group or said alkoxyalkyl group or R_3 is hydrogen atom and R_4 is hydrogen atom, said alkyl group, said alkoxyalkyl group, said alkenyl group, said alkanoyl group or said benzyl group,

when R_1 is hydrogen atom and R_2 is said alkylamino group, R_3 and R_4 individually is hydrogen atom or they may be the same or different and each represents said alkyl group, when R_1 is amino group and R_2 is nitro group, R_3 and R_4 may be the same or different and each represents said alkyl group or R_3 is hydrogen atom and R_4 is said alkyl group or said alkenyl group, and when R_1 is said group

and R_2 is nitro group, R_3 and R_4 are the same as defined above with respect to the R_5 and R_6.

4,094,983

METHOD FOR REDUCING INTRAOCULAR PRESSURE IN WARM-BLOODED ANIMALS

Nicholas S. Bodor, Lawrence, Kans., assignor to Interx Research Corporation, Lawrence, Kans.

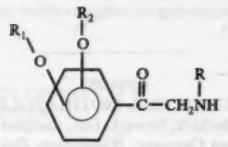
Filed Jan. 17, 1977, Ser. No. 759,779

Int. Cl.[2] A61K *31/455;* A01N *9/24*

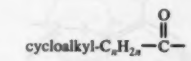
U.S. Cl. 424—266 **21 Claims**

1. A method for lowering intraocular pressure in a warm-blooded animal in need of such treatment which comprises topically applying to the eye thereof, an effective opthalmologically acceptable amount for lowering intraocular pressure of a compound selected from the group consisting of:

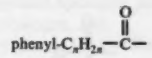
Formula I



wherein R represents a memeber selected from the group consisting of hydrogen or a C_1–C_5 straight or branched alkyl group; and wherein R_1 and R_2, which may be the same or different, represents an acyl member selected from the group consisting of alkanoyl having 1–22 carbon atoms, alkenoyl having one or two douple bonds and having 4–22 carbon atoms,



having a total of 4–10 carbon atoms of which 3–7 are ring carbon atoms in cycloalkyl and wherein *n* is zero, one, or two, phenoxyacetyl, naphthalenecarbonyl, pyridinecarbonyl,



wherein *n* is zero, one or two and phenyl is unsubstituted or is substituted by 1–3 alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, halo, trifluoromethyl, dialkylamino having 2–8 carbon atoms, and alkanoylamino having 1–6 carbon atoms; and an ophthalmologically acceptable acid addition salt thereof.

4,094,984

6-PHENYL-8-BROMO-4H-S-TRIAZOLO-[3,4C]-THIENO-[2,3E]-1,4-DIAZEPINES AND SALTS THEREOF

Karl-Heinz Weber, Gau-Algesheim; Adolf Bauer, Ingelheim am Rhein; Peter Danneberg, Ockenheim, and Franz Josef Kuhn, Bingen, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

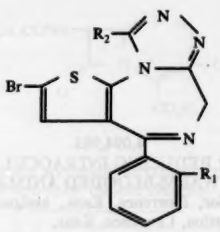
Continuation of Ser. No. 672,280, Mar. 31, 1976, abandoned, which is a continuation-in-part of Ser. No. 554,309, Feb. 28, 1975, abandoned. This application Oct. 6, 1977, Ser. No. 839,792

Claims priority, application Germany, Mar. 2, 1974, 2410030; Jul. 20, 1974, 2435041; Sep. 24, 1974, 2445430; Dec. 21, 1974, 2460776

Int. Cl.[2] A61K *31/55;* C07D *495/04, 495/14*

U.S. Cl. 424—269 8 Claims

1. A compound of the formula



wherein R_1 is hydrogen, fluorine, chlorine, bromine, nitro or trifluoromethyl; and

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms or hydroalkyl of 1 to 4 carbon atoms; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

8. The method of relieving anxiety, relieving tension, relaxing the muscles or suppressing convulsions in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective anxiolytic, tension-relieving, muscle relaxing or anticonvulsive amount of a compound of claim 1.

4,094,985

FUNGICIDAL ISOTHIAZOLES

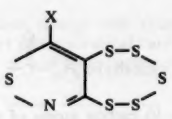
Susan Anne Vladuchick, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 731,981, Oct. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,132, Oct. 23, 1975, abandoned. This application Mar. 17, 1977, Ser. No. 777,881

Int. Cl.[2] A61K *31/425;* C07D *513/04*

U.S. Cl. 424—270 18 Claims

1. A compound of the formula



wherein

X is cyano or

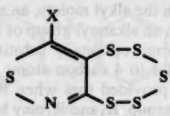
Q is Cl, $-OR_1$, $-SR_1$ or $-NR_2R_3$;

R_1 is hydrogen, alkyl of 1–2 carbon atoms;

R_2 is hydrogen or methyl; and

R_3 is hydrogen, alkyl of 1–4 carbon atoms or phenyl, with the proviso that (a) when R_2 is hydrogen, R_3 is hydrogen or alkyl of 1–3 carbon atoms or phenyl and (b) when Q is SR_1, R_1 is not hydrogen.

7. A fungicidal composition consisting essentially of a fungicidally effective amount of a compound of the formula



wherein

X is cyano or

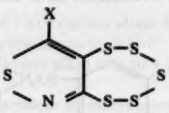
Q is $-OR_1$, $-SR_1$ or $-NR_2R_3$;

R_1 is alkyl of 1–2 carbon atoms;

R_2 is hydrogen or methyl;

R_3 is hydrogen, alkyl of 1–4 carbon atoms or phenyl; with the proviso that when R_2 is hydrogen, R_3 is hydrogen or alkyl of 1–3 carbon atoms or phenyl, and at least one of (a) an inert diluent and (b) a surface active agent.

13. A method for controlling fungi consisting essentially of applying to the area to be protected a fungicidally effective amount of a compound of the formula



wherein

X is cyano or

Q is $-OR_1$, $-SR_1$ or $-NR_2R_3$;

R_1 is alkyl of 1–2 carbon atoms;

R_2 is hydrogen or methyl;

R_3 is hydrogen, alkyl of 1–4 carbon atoms or phenyl, with the proviso that when R_2 is hydrogen, R_3 is hydrogen or alkyl of 1–3 carbon atoms or phenyl.

4,094,986

2-R-SUBSTITUTED-1,2,5-THIADIAZOLE-3-ONE ANTIMICROBIALS

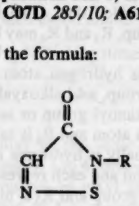
Joshua Rokach, Chonedey-Laval, and Grant W. Reader, Montreal, both of Canada, assignors to M. S. & D. (I.A.) Corp., Rahway, N.J.

Continuation-in-part of Ser. No. 684,137, May 7, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 813,015

Int. Cl.[2] C07D *285/10;* A61K *31/425*

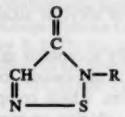
U.S. Cl. 424—270 14 Claims

1. A compound of the formula:



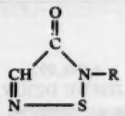
where R is an alkyl group of from 1 to 16 carbon atoms, benzyl or phenyl.

8. A composition for inhibiting growth of bacteria and fungi on agriculturally desirable plants and crops comprising a microbiologically effective amount of a compound of the formula:

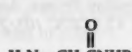


where R is an alkyl group of from 1 to 16 carbon atoms, benzyl, or phenyl and an inert carrier.

12. A method of preparing compounds of the formula:



where R is a hydrocarbon of from 1 to 16 carbon atoms comprising reacting a mole of a compound of the formula:



with from 2 to 5 moles of sulfur monohalide.

4,094,987

2-(3-M-HYDROXY-PHENYL-1-SUBSTITUTED-3-PYRROLIDINYL)-ETHANOLS

Klaus Hasspacher, Riehen, and Michael Strasser, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

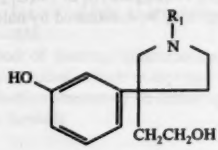
Filed Jan. 24, 1977, Ser. No. 762,209

Claims priority, application Switzerland, Jan. 28, 1976, 1070/76; Jan. 28, 1976, 1071/76

Int. Cl.[2] C07D *207/44;* A61K *31/40*

U.S. Cl. 424—274 **16 Claims**

1. A compound of formula I,



I

wherein

R_1 is alkyl of 4 to 8 carbon atoms; cycloalkyl of 4 to 6 carbon atoms; phenethyl or phenethyl monosubstituted in the phenyl residue with fluorine, chlorine, bromine, methoxy or alkyl of 1 to 4 carbon atoms,

or a pharmaceutically acceptable salt form thereof.

4. A method of treating pains in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim 1.

4,094,988

METHOD OF TREATING GASTRIC ULCERS USING 5,6-DIHYDRO-1,4-DITHIINOXIDES

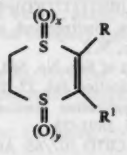
Richard C. Johnson, Ambler, Pa., assignor to Warren-Teed Laboratories, Inc., Columbus, Ohio

Filed Oct. 12, 1976, Ser. No. 731,153

Int. Cl.[2] A61K *31/385*

U.S. Cl. 424—277 **7 Claims**

1. A method of treating ulcers which comprises administering to a person in need of such treatment an effective amount of the compound of the formula:



wherein R is lower alkyl having from one to 6 carbon atoms or phenyl; R^1 is lower alkyl of from 1 to 6 carbon atoms and x and y are integers each having a value of 0 to 2 with the sum of x and y being in the range of from 1 to 4.

4,094,989

METHYLENEDIOXY SUBSTITUTED BENZENE DERIVATIVES

Friedrich Karrer, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

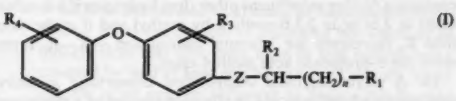
Division of Ser. No. 460,404, Apr. 12, 1974, Pat. No. 3,987,102. This application Oct. 4, 1976, Ser. No. 729,055

Claims priority, application Switzerland, Apr. 18, 1973, 5635/73; Mar. 18, 1974, 3705/74

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—282 **12 Claims**

1. A compound of the formula



(I)

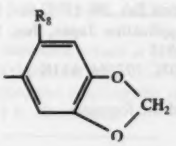
wherein

n represents the numbers 0 or 1,

Z represents oxygen,

or sulphur,

R_1 represents



R_8 represents hydrogen or n-propyl,

R_2 represents hydrogen, methyl or ethyl,

R_3 and R_4 each represent hydrogen, methyl, ethyl, methoxy, ethoxy, nitro or halogen, and

R_7 represents hydrogen or C_1-C_2-alkanoyl.

11. An insecticidal or acaricidal agent containing an insecticidal or acaricidal effective amount of a compound of claim 1 together with a suitable carrier therefor.

12. A method for the control of insects or members of the order Acarina which comprises applying to the locus thereof an insecticidal or acaricidal effective amount of a compound of claim 1.

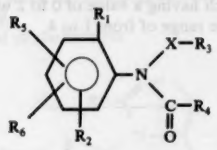
4,094,990

CERTAIN PHYTOFUNGICIDAL N-FURANYL CARBONYL AND TETRAHYDROFURANYL CARBONYL, N-(SUBSTITUTED)PHENYL ALANINES

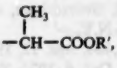
Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 563,035, Mar. 28, 1975, abandoned. This application Jul. 27, 1976, Ser. No. 709,066
Claims priority, application Switzerland, Apr. 2, 1974, 4572/74; Feb. 10, 1975, 1591/75
Int. Cl.[2] C07D *307/68;* A01N *9/28*
U.S. Cl. 424—285 17 Claims

1. A compound of the formula



wherein R_1 represents methyl, R_2 is in ortho-position to the amino group and represents methyl, ethyl or chlorine, —X—R_3 is



R_5 represents hydrogen, alkyl of 1 to 3 carbon atoms or halogen, R_6 represents hydrogen or methyl, the total number of carbon atoms of the substituents R_1, R_2, R_5 and R_6 in the phenyl ring not exceeding 8, R′ is hydrogen, methyl or ethyl, and R_4 is 2-furanyl or 2-tetrahydrofuranyl which may be substituted by methyl or halogen, with the proviso that the phenyl ring contains a further substituent other than hydrogen if it is substituted in 2,6- or in 2,3,6-position by methyl and if at the same time R_4 represents the 2-furanyl radical and —X—R_3 represents the α-propionic acid methyl ester.

14. A phytofungicidal composition comprising as active substance a phytofungicidally effective amount of a compound according to claim 1, together with a suitable carrier therefor.

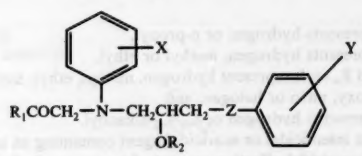
4,094,991

SUBSTITUTED N-(CARBOXYMETHYL)-3-AMINOPROPAN-2-OL DERIVATIVES

Hiromu Murai; Katsuya Ohata; Hiroshi Enomoto; Shoichi Chokai; Mitsuhiro Machara; Katsuhide Saito, and Takayuki Ozaki, all of Kyoto, Japan, assignors to Nippon Shinyaku Co., Ltd., Japan

Division of Ser. No. 692,878, Jun. 4, 1976, Pat. No. 4,064,252. This application Jan. 24, 1977, Ser. No. 761,721
Claims priority, application Japan, Jun. 17, 1975, 50-74014; Jun. 17, 1975, 50-74015
Int. Cl.[2] C07C *101/44;* A61K *31/195, 31/21*
U.S. Cl. 424—309 18 Claims

1. A compound of the formula:



wherein

Z is oxygen or sulfur;

X is hydrogen, halogeno, lower alkyl, lower alkoxy, carboxy, carbo(lower alkoxy) or carbamoyl;

Y, when Z is sulfur, is hydrogen, halogeno or lower alkyl, or, when Z is oxygen, hydrogen, halogeno, lower alkyl, lower alkoxy, aralkoxy, hydroxy, carboxy, carbo(lower alkyl) or cyano;

R_1 is hydroxy or lower alkoxy, unsubstituted or substituted by hydroxy or lower alkoxy; and

R_2 is hydrogen, lower alkyl or alkanoyl of 1 to 7 carbon atoms,

and the pharmaceutically acceptable salts thereof.

17. A pharmaceutical composition for reducing serum cholesterol and triglycerides, which comprises a serum cholesterol- and triglyceride-reducing amount of the compound of claim 1 in combination with a pharmaceutically acceptable solid or liquid inert carrier.

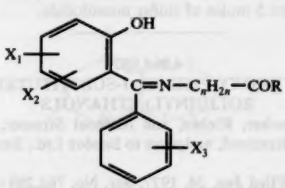
4,094,992

BENZYLIDENE DERIVATIVES

Jean-Pierre Kaplan, Plessis Robinson; Maurice Jalfre, Paris Cedex, and Don Pierre Rene Lucien Giudicelli, Fontenay Sous Bois, all of France, assignors to Synthelabo, Paris, France

Filed Jul. 16, 1976, Ser. No. 705,938
Claims priority, application France, Aug. 1, 1975, 75 24065
Int. Cl.[2] C07C *103/29*
U.S. Cl. 424—324 13 Claims

1. Compound of claim 1



in which one of X_1 and X_3 is halogen, methyl, or methoxy, and X_2 and the other of X_1 and X_3 are each independently hydrogen, halogen, methyl or methoxy, *n* represents an integer from 1 to 10, and R is NH_2, NH-(C_{3-6} cycloalkyl), NH-phenyl, NH-benzyl, NH-(C_{1-4} alkyl), N-(C_{1-4} alkyl)$_2$ or N-(C_{1-4} alkyl)-(benzyl), where each benzyl may be substituted by halogen and/or trifluoromethyl.

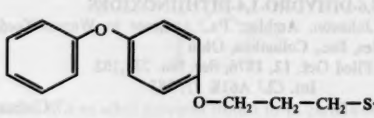
4,094,993

ETHERS

Friedrich Karrer, Zofingen, and Saleem Farooq, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,353
Claims priority, application Switzerland, Aug. 26, 1975, 11036/75; Jul. 20, 1976, 9281/76
Int. Cl.[2] A01N *9/12;* C07C *149/32*
U.S. Cl. 424—337 1 Claim

1. A method for the combatting insects and acarids which comprises applying to the locus thereof an insecticidally and acaricidally effective amount of a compound of the formula



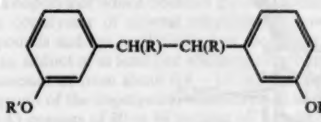
4,094,994

NOVEL DI-(3'-HYDROXYPHENYL)-ALKANE COMPOUNDS, PROCESS OF PREPARATION AND THEIR USE IN MEDICINE

Helmut Schonenberger, Unterhaching; Gerhard Kranzfelder, and Helga Schmitt-Wallenborn, both of Munich, all of Germany, assignors to Klinge Pharma GmbH, Munich, Germany

Filed May 3, 1977, Ser. No. 793,321
Claims priority, application Germany, Dec. 22, 1976, 2658307
Int. Cl.[2] A61K *31/05, 31/09;* C07C *39/16, 43/12*
U.S. Cl. 424—341 9 Claims

1. A di-(3'-hydroxyphenyl)-alkane compound of the general formula (I)



wherein R is a straight or branched alkyl of 1–6 carbon atoms and R' is hydrogen or methyl.

9. A method for treating breast carcinoma in a mammal comprising orally, parenterally, or subcutaneously administering to said mammal a breast-carcinoma-growth-inhibiting amount of the compound of claim 1.

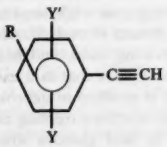
4,094,995

ETHYNYLBENZENE COMPOUNDS AND DERIVATIVES THEREOF TO TREAT PAIN, FEVER AND INFLAMMATION

Julius Diamond, Lafayette Hill, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Division of Ser. No. 574,837, May 14, 1975, which is a continuation of Ser. No. 431,254, Jan. 7, 1974, Pat. No. 3,923,910, which is a division of Ser. No. 268,419, Jul. 3, 1972, Pat. No. 3,852,364. This application Jan. 11, 1977, Ser. No. 758,458
Int. Cl.[2] A61K *31/03;* C07C *25/00*
U.S. Cl. 424—353 73 Claims

1. A method of treating inflammation, pain or fever in a warm-blooded animal which comprises administering to the animal an effective amount of an active agent which is a compound of the formula



where

R is hydrogen, alkyl of 1 to 7 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, 1 to 7 carbon atoms alkyl substituted cycloalkyl of 5 to 7 carbon atoms, cycloalkenyl of 5 to 7 carbon atoms, phenyl or substituted phenyl where the substituent is Y'',

Y and Y' are each selected from the group consisting of hydrogen, halo and trifluoromethyl;

Y'' is selected from the group consisting of Y, and lower alkyl,

with the proviso that at least one of Y and Y' is other than hydrogen.

4,094,996

PACKAGE OF CONVENIENCE FOOD

Sakuichi Sakakibara, Kobe; Ko Sugisawa; Takashi Kimura, both of Nara, and Atsushi Yasuda, Sakai, all of Japan, assignors to House Food Industrial Company Limited, Higashi-Osakashi, Japan

Filed May 12, 1977, Ser. No. 796,343
Claims priority, application Japan, May 14, 1976, 51-60170[U]
Int. Cl.[2] B65B *29/06*
U.S. Cl. 426—115 7 Claims

1. A package of convenience food comprising:

(a) a container of water-resistant material having an open side;

(b) a body of a first dehydrated food and at least one separate body of a second dehydrated food in said container,

(1) each of said bodies being capable of being reconstituted by contact with hot water,

(2) said first food consisting essentially of at least one source of carbohydrate substantially insoluble in and lighter than water and having a surface directed toward said open side,

(3) said at least one body consisting essentially of foamed or cellular dehydrated solid material substantially insoluble in water but capable of absorbing hot water more quickly than said first food, most of said surface being covered by said at least one body which absorbs water quickly in an amount sufficient to reduce the floating tendency of the carbohydrate material such that the uniform reconstitution of said first dehydrated food is accelerated.

4,094,997

BEEF FLAVOR SUBSTANCE, PROCESS FOR PRODUCING SAME AND BEEF-FLAVORING AGENT

Tetsuo Aishima, and Akio Nobuhara, both of Kasukabe, Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed Mar. 10, 1977, Ser. No. 776,367
Claims priority, application Japan, Mar. 12, 1976, 51-26119
Int. Cl.[2] A23L *1/238*
U.S. Cl. 426—533 17 Claims

1. A beef flavor substance which is prepared by mixing 1 part by weight of an animal fat with 0.1 to 1.5 parts by weight of a brewed soy sauce, and reacting the resulting mixture at 130° to 220° C. for 5 to 30 minutes.

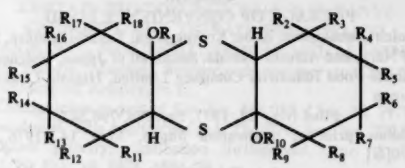
4,094,998

FLAVORING WITH 1,8-DIHYDROXY-2,9-DITHIA-TRICYCLO TETRADECANE AND DERIVATIVES THEREOF

Michael J. Greenberg, Chicago, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 17, 1977, Ser. No. 769,520
Int. Cl.[2] A23L *1/231*
U.S. Cl. 426—535 23 Claims

1. A process for altering the flavor of a foodstuff comprising adding to the foodstuff an amount of a flavorant 1,8-dihydroxy-2,9-dithia-tricyclo[8.4.0.0^{3,8}]tetradecane effective to impart a meat flavor and represented by the formula:



wherein R_2 to R_9 and R_{11} to R_{18} are the same or different, and are an alkyl group containing from 1 to 4 carbon atoms, hydrogen, or a hydroxyl group; and R_1 and R_{10} are the same or different, and are an alkyl group containing from 1 to 4 carbon atoms, an acetyl group, a phenacyl group, or a benzyl group.

4,094,999

ANTIOXIDANT FOR FOODS

Murray S. Cohen, Convent Station, N.J., and Donald E. O'Connell, Marietta, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 8, 1977, Ser. No. 822,599
Int. Cl.[2] A23D *5/04;* A23L *3/00*
U.S. Cl. 426—547 **4 Claims**

1. A food composition stabilized by the presence therein of a minor proportion sufficient to inhibit oxidation thereof a dialkyl pentaerythritol diphosphite wherein the alkyl groups each contain 10–18 carbon atoms.

4,095,000

PROTEIN-SAVING FOODSTUFF AND FODDER ADDITIVE

Max Brenner, Basel, Switzerland, assignor to Max Brenner, Basel, Switzerland

Filed May 16, 1975, Ser. No. 578,228
Claims priority, application Switzerland, May 17, 1974, 6801/74
Int. Cl.[2] A23J *1/00, 3/00;* A61K *37/00;* C07C *103/52*
U.S. Cl. 426—656 **9 Claims**

1. Protein-saving foodstuff and fodder additive, comprising the following linked components:

(1) nutritive substances consisting of essential aminoacids and derivatives thereof selected from the group consisting of methionine, methionylmethionine, glycylmethionine, glycylglycylmethionine, methionylglycine, lysine, glycyllysine, isoleucine, tryptophane and threonine; and mixtures of methionine and lysine, and mixtures of methionine, lysine, leucine, isoleucine, valine, tyrosine, phenylalanine, tryptophane and threonine; and esters and amides of said compounds and of said mixtures of compounds; and α-amino-γ-methylmercapto-butyronitrile; and

(2) polyhydroxy compounds selected from the group consisting of non-reducing disaccharides, oligosaccharides and polysaccharides, all being derived from pentoses and hexoses, derivatives of said polysaccharides which are chemically modified, reducing saccharides, and mixtures thereof, said polyhydroxy compounds being modified by cyanation or phosgenation;

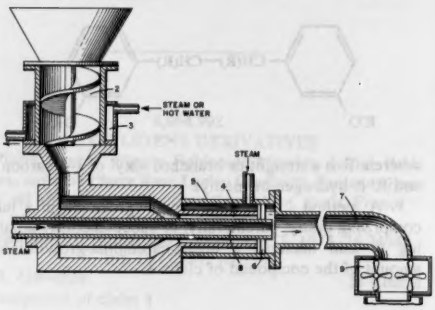
whereby components (1) and (2) are linked by hydrolyzable carbon atoms which upon hydrolysis are released in the form of carbon dioxide, the bonding from said hydrolyzable carbon atoms to component (1) being to primary or secondary amino groups that constitute part of the amino acid or amino acid derivative structure, and the bonding from said hydrolyzable carbon atoms to component (2) being to oxygen or nitrogen atoms attached to carbon atoms of said polyhydroxy compounds, both mutually bonded components being liberated upon hydrolysis at the same time as the carbon dioxide originating from the bonding carbon atoms.

4,095,001

PROTEIN TEXTURIZATION

William M. Hildebolt, Mickleton, and Murray T. Hundt, Maple Shade, both of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Dec. 31, 1975, Ser. No. 645,613
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—656 **16 Claims**



1. A method for producing texturized protein in the form of a relatively dense protein segment having a unidirectional laminated surface structure, said method comprising:

a. mixing untextured protein material and water to form a protein dough, said dough containing from about 60 to about 73% solids;

b. advancing said dough to an extrusion die at a temperature below that at which texturization takes place;

c. continuously extruding said dough in the form of a thin sheet of protein material through said extrusion die while simultaneously texturizing both surfaces of said thin sheet as it passes through said die by applying heat to both surfaces of said sheet from a source external to the die walls;

d. passing the surface-texturized extruded sheet directly into a confined treating zone while simultaneously directing a heated gaseous stream at said extruded sheet as it enters said confined treating zone, said heated gaseous stream being at a pressure such that said extruded thin sheet of protein material is retained in unbroken form for a short distance into said confined treating zone before the shear forces created by said gaseous stream reach sufficient strength to break off a segment of said sheet whereby said unbroken sheet is subjected to the conditions in said confined zone for an extended period of time;

e. breaking off a segment of said extruded sheet with said gaseous stream, said gaseous stream further propelling said segments through said confined treatment zone, said heated gaseous stream being at a temperature such that the protein in the segments which has not yet been texturized is texturized in said confined zone;

f. passing said texturized protein segments through means for maintaining back pressure disposed at the discharge end of said confined treating zone; and

g. recovering said texturized protein segments.

4,095,002
HEAT-CURABLE PULVERULENT COATING AGENT OF A MIXTURE OF COPOLYMERS CONTAINING GLYCIDYL GROUPS AND AN ADDUCT OF ALIPHATIC DICARBOXYLIC ACID AND 2,4,6-TRIS(N',N'',N'''-DIMETHYLAMINOMETHYL)-PHENOL

Themistoklis Katsimbas, Hamburg, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

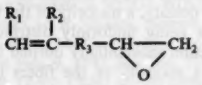
Filed Mar. 21, 1975, Ser. No. 560,636
Claims priority, application Germany, May 22, 1974, 2424809
Int. Cl.[2] C08L *63/00*
U.S. Cl. 427—27 **12 Claims**

1. A pulverulent coating agent comprising a mixture of

A. a copolymer which contains glycidyl groups and which is a copolymer of several ethylenically unsaturated compounds and has a relatively low molecular weight, and

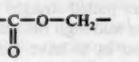
B. an adduct of at least one aliphatic dicarboxylic acid, in an amount of from about 0.8 - 1.1 acid groups per glycidyl group of the copolymer, characterized in that component (A) consists of 80 to 96 percent by weight of copolymers, containing epoxide groups and hydroxyl groups, which copolymers have Durran softening points of about 90° - 120° C and are soluble in organic solvents, of

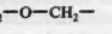
a. 4 to 28 percent by weight of ethylenically unsaturated epoxide monomers with 6 - 12 carbon atoms of the general formula

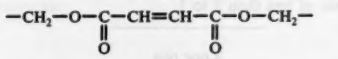


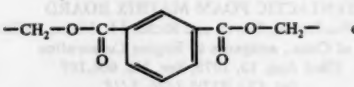
wherein

R_1 and R_2 = H or $-CH_3$

R_3 =  or

 or

 or

 or is absent,

b. 10 - 96 percent by weight of acrylic acid esters or methacrylic acid esters of aliphatic saturated monoalcohols with 1 - 8 carbon atoms, and

c. up to 70 percent by weight of styrene or vinyltoluene; and (B) consists of 4 -20 percent by weight of an adduct of a saturated straight-chain aliphatic dicarboxylic acid of the formula $HOOC—(CH_2)_n—COOH$, wherein n is a whole number from 5 to 12, and 2,4,6-tris(N',N'',N'''-dimethylaminomethyl)-phenol, and these components of the adduct can be present in a weight ratio of 97:3 to 99:1.

4,095,003
DUPLEX COATING FOR THERMAL AND CORROSION PROTECTION

Merle Howard Weatherly, Indianapolis, and Robert Clark Tucker, Jr., Brownsburg, both of Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 9, 1976, Ser. No. 721,863
Int. Cl.[2] C23C *7/00*; C23D *5/00*
U.S. Cl. 427—34 **6 Claims**

1. Method for producing a duplex coating on a substrate to impart thermal and corrosion resistance thereto comprising:

a. plasma depositing on said substrate as a primary layer a first sublayer wherein the particle size of the powder is less than 44 microns and then depositing a second sublayer on said first sublayer wherein the particle size of the powder has a significant fraction greater than 44 microns using powder consisting of a metal alloy selected from the class consisting of nickel alloys, cobalt alloys, iron alloys and mixtures thereof with additions of at least one metal selected from the group consisting of 10 to 50 wt.% chromium, 5 to 25% aluminum, 0.5 to 10wt.% of another metal selected from the class consisting of yttrium, rare earth metals, hafnium, tantalum, tungsten, zirconium, platinum, rhodium, paladium, and silicon, and said layer having a surface roughness of at least 250×10^{-6} inches AA;

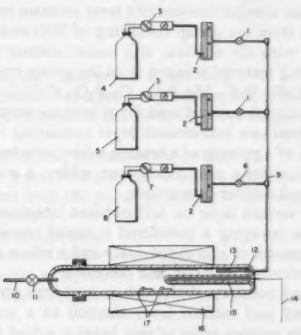
b. plasma depositing an oxide layer on said rough primary layer surface such oxide layer consisting of an oxide taken from the class consisting of zirconia, stabilized zirconia, magnesium zirconate and alumina and having a density of less than 88%;

c. and heat treating said duplex coating in a non-oxidizing atmosphere at a time and temperature to permit sintering of the components of the primary layer to cause effective sealing of the primary layer.

4,095,004
PROCESS FOR LOW TEMPERATURE STOICHIOMETRIC RECRYSTALLIZATION OF COMPOUND SEMICONDUCTOR FILMS

Lewis M. Fraas, Malibu, and William P. Bleha, Jr., Pacific Palisades, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 563,890, Mar. 31, 1975, abandoned. This application Mar. 31, 1977, Ser. No. 783,257
Int. Cl.[2] H01L *21/363, 21/203*
U.S. Cl. 427—74 **6 Claims**



1. A vapor phase controlled processing method for producing recrystallized MX films with improved photoelectric properties where M is a metal taken from Group II or III Of the periodic table and X is a high vapor pressure element taken from Group V or VI of the periodic table comprising the steps of:

(a) depositing an MX compound onto an amorphous substrate taken from the group comprised of soda-lime glass, soda-lime glass overcoated with ITO, sapphire, borosilicate glass, and fused silica via physical vapor deposition to form a thin film;

(b) placing said film into a reaction chamber equipped with a means for introducing alternatively an inert and reactive gaseous atmosphere;

(c) raising the temperature of said film in said chamber to its recrystallization temperatures while purging said chamber with an inert gas;

(d) passing a reactive atmosphere of XH_n where n may be 2 or 3 and H_2 through said chamber whereby a vapor pressure ratio is induced and maintained at the MX compound

stoichiometric level while maintaining said recrystallization temperature over a period ranging from 5 to 50 minutes; and

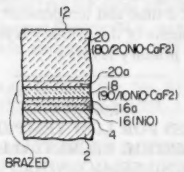
(e) subsequently cooling said film by reintroducing an inert gas until the temperature of said film has returned to room temperature.

4,095,005

METHOD OF PRODUCING LOW WEAR COATING REINFORCED WITH BRAZING SOLDER FOR USE AS RUBBING SEAL

Katsuhiro Kishida, and Akira Oyamada, both of Yokohama, Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Aug. 10, 1976, Ser. No. 713,264
Claims priority, application Japan, Aug. 18, 1975, 50-99455
Int. Cl.[2] F01D *11/08*
U.S. Cl. 427—376 B 7 Claims



1. A method of producing a low wear coating useful as a high temperature rubbing contact seal layer on a metal substrate, the method comprising the steps of:

forming at least one intermediate layer on said substrate by individually flame spraying a powdered material containing at least a major amount of a wear resistant metal oxide selected from the group consisting of NiO and CoO optionally with the addition of a minor amount of a solid lubricating material selected from the group consisting of MgF_2, CaF_2, BaF_2, $Mg_2P_2O_7$, $Ca_2P_2O_7$, CaB_4O_7 and PbO, said powdered material used for at least an outmost one of said at least one intermediate layer containing from 10 to 50 Wt% of a powder of a brazing solder selected from the group consisting of a nickel base solder, a copper base solder and a silver base solder;

forming a surface layer on said outmost intermediate layer by flame spraying a powdered material consisting of a major amount of said metal oxide and a minor amount of said lubricating material; and thereafter

heating said substrate with said at least one intermediate layer and said surface layer thereon to a temperature about the melting point of said brazing solder thereby to cause said brazing solder to melt and partially permeate into an inmost region of said surface layer.

4,095,006

CADMIUM SULFIDE FILM

John Francis Jordan, and Curtis Magill Lampkin, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Filed Mar. 26, 1976, Ser. No. 670,625
Int. Cl.[2] H01C *31/00*
U.S. Cl. 427—427 14 Claims

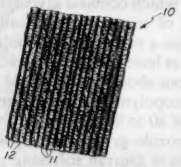
1. The method of forming a film including cadmium sulfide crystals, comprising the step of spraying a solution comprising a water soluble cadmium salt other than cadmium chloride, a water soluble organic sulfur containing compound capable of reacting with a cadmium salt in the presence of chloride ions to form cadmium sulfide crystals, and a water soluble chlorine containing compound, other than cadmium chloride, which freely disassociates chloride ions in aqueous solution to catalyze a reaction involving said cadmium salt and said sulfur containing compound to form a film of said cadmium sulfide crystals on a heated substrate.

4,095,007

BIAXIALLY ORIENTED NONWOVEN FABRICS AND METHOD OF MAKING SAME

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 506,843, Sep. 17, 1974, Pat. No. 3,969,561. This application Jul. 12, 1976, Ser. No. 704,582
The portion of the term of this patent subsequent to Jul. 13, 1993, has been disclaimed.
Int. Cl.[2] B32B *5/12*
U.S. Cl. 428—113 5 Claims



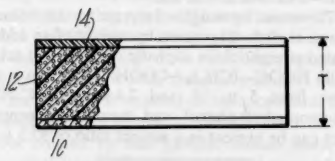
1. In a biaxially oriented nonwoven fabric of fibers having adjacent and alternating striped areas of low fiber density and areas of high fiber density, a majority of the fibers in said low fiber density areas being uniformly distributed therein and oriented in a direction substantially normal to the axis of the striped area and, a majority of the fibers in the high fiber density area that lies directly adjacent to low fiber density areas being uniformly distributed therein and oriented in a direction substantially parallel with the stripes of the low fiber density area, the improvement comprising a majority of the fibers in said low fiber density area are pulled straight thereacross, while a majority of the fibers in said high fiber density area are accordian folded in a manner as to have the fiber segments therein aligned substantially parallel to each other; said fabric having a machine direction to cross direction tensile strength ratio of less than 2 to 1.

4,095,008

SYNTACTIC FOAM MATRIX BOARD

Donald W. Sundstrom, Storrs, and Richard L. Maine, Willimantic, both of Conn., assignors to Rogers Corporation

Filed Aug. 13, 1975, Ser. No. 604,187
Int. Cl.[2] B32B *3/26, 5/18*
U.S. Cl. 428—215 10 Claims



1. A matrix board for molding printing plates including:

a carrier sheet; and

a layer of syntactic foam on said carrier sheet, said layer of syntactic foam including, by weight, from 25–50% thermosetting resin, said thermosetting resin being not more than partially cured, from 25–75% hollow particles and from 5–25% an aqueous latex dispersion binder;

said matrix board being deformable under pressure of from 25 psi to 125 psi and curable on exposure to heat to form a matrix board for the molding of printing plates.

3. A matrix board as in claim 1 wherein:
said carrier sheet is a relatively thin layer of from 0.004 to 0.020 inches; and
said syntactic foam layer is a relatively thick layer of from 0.060 to 0.500 inches.

4,095,009
Patent Not Issued For This Number

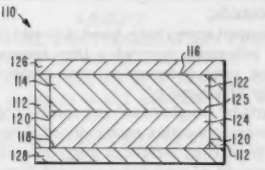
4,095,010
GLASS FIBER WOOL BINDER
Wade V. Zellar, and Carl R. Strauss, Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio
Filed Feb. 9, 1977, Ser. No. 767,089
Int. Cl.[2] B32B *17/02;* **C03C** *25/02;* **C08L** *61/06, 89/04*
U.S. Cl. 428—375 **12 Claims**

1. At least one glass fiber at least a portion of the surface of which is in contact with a residue produced by removing water from an aqueous composition comprising: (1) a phenolic resole resin, (2) animal bone glue, (3) a sulfite process lignin and (4) dicyandiamide.

7. An aqueous composition comprising: (1) a phenolic resole resin, (2) animal bone glue, (3) a sulfite process lignin, and (4) dicyandiamide.

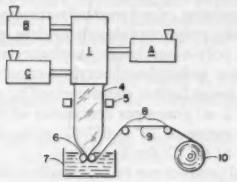
4,095,011
ELECTROLUMINESCENT SEMICONDUCTOR DEVICE WITH PASSIVATION LAYER
Frank Zygmunt Hawrylo, Trenton, and Henry Kressel, Elizabeth, both of N.J., assignors to RCA Corp., New York, N.Y.
Filed Jun. 21, 1976, Ser. No. 698,482
Int. Cl.[2] B32B *15/04*
U.S. Cl. 428—469 **4 Claims**

1. An electroluminescent semiconductor device comprising:
a body of III–V semiconductor material having as a constituent component arsenic, said body having a first surface, a second surface opposite said first surface, side surfaces substantially perpendicular to said first and second surfaces, said body being capable of emitting electroluminescence from at least one of said side surfaces, and
a passivation layer on at least said emission surfaces, said passivation layer being of a material selected from the



group consisting of arsenic sulfide, As_2S_3, arsenic selenide, As_2Se_3, and arsenic telluride, As_2Te_3.

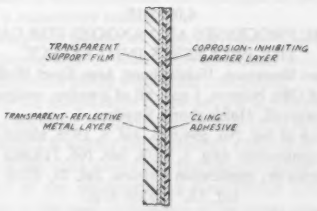
4,095,012
ORIENTED NYLON AND LAMINATES THEREOF
Henry G. Schirmer, Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Continuation-in-part of Ser. No. 535,772, Dec. 22, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,511
Int. Cl.[2] B28B *3/20;* **B29C** *1/00;* **C08L** *77/00;* **B32B** *27/34*
U.S. Cl. 428—474 **5 Claims**



1. A laminated film article comprising:
(a) a moisture-free layer comprising a blend of 20 to 80% by weight of nylon 6 and 80 to 20% by weight of nylon 66; and,
(b) polymeric layers laminated to each side of said blended nylon layer, said polymeric layers comprising polymers selected from the group consisting of olefin polymers and copolymers.

4. A film comprising:
(a) a blend of 20 to 80% by weight of nylon 6 with 80 to 20% by weight of nylon 66; and,
(b) said film being oriented in at least one direction.

4,095,013
REUSABLE SOLAR CONTROL FILM AND METHOD OF MAKING
Thomas J. Burger, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed May 16, 1977, Ser. No. 796,873
Int. Cl.[2] B32B *27/30*
U.S. Cl. 428—522 **6 Claims**



1. In a solar control sheet material comprising a self-supporting transparent film, a transparent-reflective coat of metal

bonded to one face of said film, and a layer of polymeric material protectively overlying said metal coat, said sheet material having particular utility for application to the room side of windowpanes to reduce light transmission and heat transmission from outside,

the improvement comprising, bonded to said product over said layer of polymeric material, a thin, transparent stratum of plasticized resin composition, said composition consisting essentially of a blend of

1. 100 parts by weight of solvent-soluble copolymer of vinyl monomers, consisting essentially of either
   a. 80–97 parts by weight of vinyl chloride and 3–20 parts by weight of monomers selected from the group consisting of vinyl acetate, vinyl alcohol and dibasic acid, or
   b. vinylidene chloride:acrylonitrile copolymer,
2. 5 to 100 parts by weight of at least one plasticizer for vinyl resins,
3. 1 to 5 parts by weight of at least one lubricating, chlorine-scavenging light stabilizer for vinyl resins, said stabilizer being a liquid soap selected from the class consisting essentially of
   a. soaps of at least two divalent metals selected from the group consisting essentially of barium, cadmium and zinc, and
   b. tin soaps,
4. 5 to 200 parts of at least one tack-controlling, adhesion buildup-inhibiting polymeric modifier selected from the class consisting of polymethylmethacrylate, polyethylmethacrylate, polyisobutylmethacrylate, poly-n-butylmethacrylate, poly-n-butylmethylmethacrylate, and n-butylmethacrylate: isobutylmethacrylate copolymer,

said stratum being further characterized by adhesion to glass in the range of 2–40 grams per centimeter of width throughout a temperature range of 20° – 65° C., even after exposure to a temperature of 65° C. for 2 weeks,

whereby said product can be repeatedly utilized in the cycle of being applied to and firmly bonded to a windowpane, thereafter subjected to a wide range of sun exposure and temperatures for a period of months without either degradation or excessive adhesive buildup, and removed without distortion.

4,095,014

WEAR-RESISTANT ZINC ARTICLES

Richard C. Iosso, 301 South Lancaster Ave., Mt. Prospect, Ill. 60056

Filed Jul. 6, 1976, Ser. No. 702,533
Int. Cl.² B32B *15/00*
U.S. Cl. 428—658 **2 Claims**

1. An article of manufacture which comprises a zinc base metal having a substantially continuous, wear-resistant chromium skin layer on at least one surface thereof and a chromium-enriched subsurface layer of said zinc base metal immediately below said chromium skin layer; said subsurface layer containing at least about 0.1 percent by weight chromium, having a gradually decreasing chromium content in a direction inwardly away from said skin layer, being at least as thick as said skin layer, and having a hardness greater than the hardness of said zinc base metal below said subsurface layer.

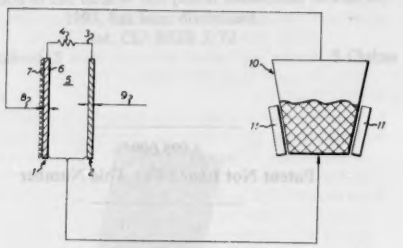
4,095,015

GALVANIC PROCESSES AND ANODES FOR CARRYING THE PROCESSES INTO EFFECT

Olle Lennart Siwersson, Helsingborg; Arne Evert Wall, Landskrona, and Olle Nilsson, Lund, all of Sweden, assignors to AB S. T. Powercell, Helsingborg, Sweden

Continuation of Ser. No. 594,093, Jul. 8, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,643
Claims priority, application Sweden, Jul. 15, 1974, 7409209
Int. Cl.² H01M *8/20*
U.S. Cl. 429—15 **9 Claims**

1. A process of counteracting the formation of a passivating anode coating in the operation of a galvanic primary cell comprising an alkaline electrolyte, an anode, a cathode and an electrolyte chamber therebetween which are interconnected via an outer circuit for tapping electric energy, the active material of the anode consisting essentially of iron, particularly iron powder, while the cathode is an oxygen or an air elec-



trode, comprising supplying oxygen in liquid complexed form obtained by complexing oxygen with an oxygen complexing agent which is an aromatic compound, and complexing the iron ions formed at the anode with a complexing agent for iron ions.

4,095,016

PROCESS FOR THE POLYMERIZATION OF α-OLEFINS

Frederick Elias Carrock, Paramus; Peter James Perron, Pompton Plains, and Edward August Zukowski, Clark, all of N.J., assignors to Dart Industries, Inc., Los Angeles, Calif.

Filed Dec. 15, 1976, Ser. No. 750,751
Int. Cl.² C08F *4/66, 10/06*
U.S. Cl. 526—137 **8 Claims**

1. In a process for the continuous polymerization of at least one α-olefin monomer having from 2 to 8 carbon atoms per molecule wherein monomer feed and catalyst components are fed continuously to the reactor and product is withdrawn in a substantially continuous fashion as a slurry in liquid monomer, said slurry having a solids content between about 15 and about 50 percent by weight, the improvement which comprises: polymerizing the α-olefin monomer at a temperature between about 125° F and about 175° F and at a pressure of at least 150 psi and sufficient to maintain monomer in the liquid phase in the presence of a catalyst system comprising:

(1) between about 0.02 and about 0.3 percent by weight based on the α-olefin monomer feed rate of a modified titanium trichloride component obtained by agitating in the presence of a liquid aromatic hydrocarbon diluent at a temperature of from about 140° F to about 176° F a titanium trichloride of the formula $n\cdot TiCl_3\cdot AlCl_3$, where n has a value between about 1 and about 5, with sufficient phosphorus oxitrichloride to provide a titanium to phosphorus mole ratio of about 3:1 to about 10:1 in the modified component, separating said component from the diluent and drying said component;

(2) an organoaluminum compound selected from aluminum trialkyls or dialkyl aluminum halides or mixtures thereof in amounts from about 1.9 moles to about 4 moles per mole of titanium chloride, and

(3) between about 40 and about 150 ppm by weight based on the α-olefin monomer feed rate of a trialkyltrithiophosphite, wherein each of the alkyl groups contain from 1 to 20 carbon atoms.

4,095,017
VINYL MONOMER POLYMERIZATION OR COPOLYMERIZATION CATALYZED BY ORGANOALUMINUM-ORGANOPHOSPHINE-METAL SALT OF A BETA-DIKETONE CATALYST SYSTEM

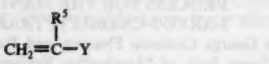
Henry L. Hsieh, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 577,137, May 13, 1975, Pat. No. 4,020,018, which is a division of Ser. No. 416,816, Nov. 19, 1973, Pat. No. 3,925,317. This application Jan. 21, 1977, Ser. No. 761,081

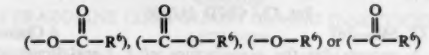
Int. Cl.[2] C08F *4/52*

U.S. Cl. 526—188 **22 Claims**

1. A process for the polymerization of at least one vinyl monomer selected from the group consisting of vinyl esters, vinyl ethers, and vinyl ketones, represented by



wherein R^5 represents hydrogen or an alkyl, aryl, alkaryl, or aralkyl, radical containing up to 8 carbon atoms, and Y is



wherein R^6 represents an alkyl, aryl, alkaryl, or aralkyl, radical containing up to 20 carbon atoms under polymerization conditions, employing a catalyst system comprising (I) a hydrocarbon aluminum compound R_nAlH_m wherein each R is a hydrocarbon radical, *n* is an integer of 1 to 3, inclusive, and *m* is 0 or an integer of 1 or 2, such that $n + m$ equals 3, (II) a triorganophosphine compound R'_3P wherein R' is hydrocarbon or alkoxy-substituted hydrocarbon, and (III) a beta-diketone substantially as the metal salt of said beta-diketone, in catalytically effective ratios, wherein said metal of said (III) is beryllium, magnesium calcium, strontium, barium, boron, aluminum, gallium, indium, thallium, germanium, tin, lead, zinc, cadmium, or mercury.

4,095,018
N,N-BIS-HYDROXYALKYL-3,5-DI-T-BUTYL ANILINES ACCELERATORS FOR REDOX POLYMERIZATION OF UNSATURATED COMPOUNDS

Werner Schmitt; Robert Purrmann, both of Starnberg, and Peter Jochum, Hechendorf, all of Germany, assignors to ESPE Fabrik Pharmazeutischer Praparate GmbH, Germany

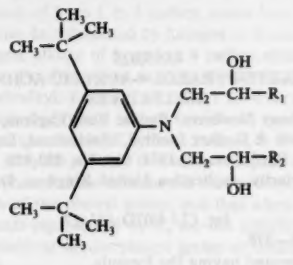
Filed Dec. 17, 1976, Ser. No. 751,726

Claims priority, application Switzerland, Dec. 24, 1975, 16787/75

Int. Cl.[2] C08F *4/40, 20/04, 20/10, 20/14*

U.S. Cl. 526—211 **5 Claims**

1. In a method for the redox polymerization of unsaturated compounds, the improvement which comprises using as the accelerator in said polymerization N,N-bis-hydroxyalkyl-3,5-di-t-butyl anilines having the structural formula



wherein R_1 and R_2 are the same or different and are H or a lower alkyl group having 1 to 4 carbon atoms.

4,095,019
FREE RADICAL POLYMERIZATION PROCESS UTILIZING NOVEL INITIATORS

Kenneth H. Markiewitz, and Alfred J. Restaino, both of Wilmington, Del., assignors to ICI Americas Inc., Wilmington, Del.

Filed Apr. 5, 1976, Ser. No. 673,539

Int. Cl.[2] C08F *4/00, 20/70, 26/00, 116/00*

U.S. Cl. 526—215 **27 Claims**

1. A method of polymerizing a monomer composition containing one or more ethylenically unsaturated compounds susceptible to free radical polymerization which comprises initiating polymerization by contacting the composition with an effective amount of dissolved initiating compound of the formula $R_1—N—(CH_2COOH)_2$ where R_1 is substituted or unsubstituted aryl radical, provided that the ethylenically unsaturated compounds do not contain any group with which the acid group of the initiator will preferentially react chemically.

4,095,020
PROCESS FOR CONTROLLED PHASE TRANSFORMATION OF ALPHA PHASE OF POLY(VINYLIDENE FLUORIDE) TO THE GAMMA PHASE

William M. Prest, Jr., Webster, and David J. Luca, Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1977, Ser. No. 772,069

Int. Cl.[2] C08F *6/00*

U.S. Cl. 528—494 **2 Claims**

1. A process for enhancement in the electret behavior of poly(vinylidene fluoride), said process comprising:

(a) providing a sample of poly(vinylidene fluoride), said sample comprising predominately the alpha and/or beta phase of said polymer;

(b) contacting said sample with a phase transformation agent, said phase transformation agent comprising a block copolymer having at least one siloxane segment and at least one oxyalkylene segment

the siloxane segment of said block copolymer comprising at least one trifunctional silicon atom and at least three difunctional silicon atoms,

the trifunctional silicon atom being bonded to three oxygens and a single monovalent hydrocarbon radical and joined to the difunctional silicon atoms through oxysilicon bonds,

the difunctional silicon atoms having bonded thereto two monovalent hydrocarbon radicals and the oxyalkylene segment of the block copolymer,

the oxyalkylene segment of the block copolymer comprising at least five oxyalkylene groups bonded to one another by oxycarbon bonds and bonded at one end to the siloxane segment of the copolymer and encapped at the other end with a monoether radical;

(c) heating the sample of poly(vinylidene fluoride) either concurrent with or subsequent to contact with the phase transformtion under controlled conditions,

whereby the temperature of the sample is elevated to 30K° below the point at which substantially all of alpha phase of the sample is melted and thereafter allowed to increase at rate of less than about 5K° per minute through the melt region of the polymer to a temperature about 5K° in excess of the peak endotherm of the alpha phase; and

(d) cooling the sample sufficiently to result in its recrystallization to the gamma phase of the polymer.

4,095,021

3-CARBAMOYLOXYMETHYL OR N-METHYL-CARBAMOYLOXYMETHYL-7-[2-CARBOXYMETHOXYIMINO-2-(FUR-2-YL OR THIEN-2-YL)ACETAMIDO]CEPH-3-EM-4-CARBOXYLIC ACIDS AND DERIVATIVES THEREOF

Janice Bradshaw, Harrow; Martin Christopher Cook, Liverpool, and Gordon Ian Gregory, Chalfont St. Peter, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

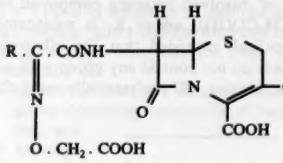
Division of Ser. No. 533,451, Dec. 16, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,244

Claims priority, application United Kingdom, Dec. 21, 1973, 59517/73

Int. Cl.[2] C07D *501/34;* A61K *31/545*

U.S. Cl. 544—22 4 Claims

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula



wherein

R is thienyl or furyl; and

R′ is hydrogen or methyl and a physiologically acceptable salt, ester or 1-oxide thereof.

4,095,022

PRODUCTION OF BIS-(MORPHOLINO-N-ALKYL) ETHERS

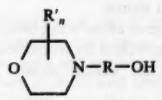
Michael E. Brennan; Philip H. Moss, and Ernest L. Yeakey, all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 583,014, Jun. 2, 1975, Pat. No. 4,026,935. This application Apr. 23, 1976, Ser. No. 679,590

Int. Cl.[2] C07D *265/28*

U.S. Cl. 544—87 13 Claims

1. A process for producing a bis-(morpholino-N-alkyl) ether compound from the corresponding N-(hydroxyalkyl)morpholine compound, said N-(hydroxyalkyl)morpholine compound having the formula:



wherein R is a straight chain or a branched chain alkyl radical of from 2 to 10 carbon atoms, R′ is a lower alkyl radical, and n is an integer from 0 to 4 comprising the steps of:

contacting said N-(hydroxyalkyl)morpholine compound with a catalytically effective amount of a phosphorus-containing substance selected from the group consisting of acidic metal phosphates, phosphoric acids and their anhydrides, or phosphorous acids and their anhydrides, alkyl or aryl phosphate esters, alkyl or aryl phosphite esters, alkyl or aryl substituted phosphorous and phosphoric acids, alkali metal monosalts of phosphoric acid, the thioanalogs of the foregoing, phosphoric acid-impregnated silicas having from about 10 to about 30 wt. % phosphoric acid and mixtures thereof, at a temperature of from about 200° C to about 300° C under a pressure sufficient to maintain the mixture substantially in liquid phase; and

recovering said bis-(morpholino-N-alkyl) ether compound from the reaction mixture.

4,095,023

6-METHOXY-N-VANILLYLIDENE-4-CHROMANAMINE

George C. Wright, and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,105

Int. Cl.[2] C07D *311/68*

U.S. Cl. 542—422 1 Claim

1. The compound 6-methoxy-N-vanillylidene-4-chromanamine.

4,095,024

PROCESS FOR THE MANUFACTURE OF 1-ARYL-3-CARBOXYPYRAZOLID-5-ONES

Ian George Cameron Fleming, and Raymond Vincent Heavon Jones, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

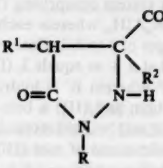
Filed Jan. 30, 1976, Ser. No. 653,832

Claims priority, application United Kingdom, Jan. 31, 1975, 4291/75

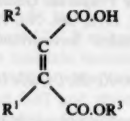
Int. Cl.[2] C07D *231/08*

U.S. Cl. 548—367 6 Claims

1. A process for the manufacture of a 1-aryl-3-carboxypyrazolid-5-one compound of the formula: Ser. No. 653,832 - Fleming et al



wherein R^1 and R^2 represent hydrogen and R represents phenyl; phenyl substituted with a member of the group consisting of methyl, chloro, nitro, carboxy and sulpho; naphthyl; sulphonaphthyl; nitro-disulphostilbenyl; diphenyl; diphenylamine; diphenyloxide; diphenyl sulphide; diphenylethane and their mono- or di-sulphonated derivatives which comprises heating, in an aqueous medium and in the presence of an acid-binding agent, a mixture of a hydrazine of the formula $R.NH.NH_2$ with an ester of the formula:



wherein R_3 is an alkyl, cycloalkyl, aralkyl or aryl group.

4,095,025

1,3-DIARYL-PYRAZOL-4-ACRYLIC ACID AND DERIVATIVES

Robert Anthony Newberry, Bourne End, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

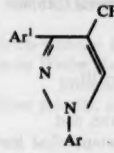
Filed Nov. 30, 1971, Ser. No. 203,458

Claims priority, application United Kingdom, Dec. 7, 1970, 58051/70

Int. Cl.[2] C07D *231/12*

U.S. Cl. 548—378 2 Claims

1. A compound having the formula



in which Ar and Ar^1 are aryl radicals selected from the group consisting of phenyl, halophenyl, lower alkyl phenyl, lower alkoxyphenyl, dimethoxyphenyl, hydroxyphenyl, nitrophenyl, di-(lower alkyl)aminophenyl, trifluoromethylphenyl, methylthiophenyl, furyl, thienyl and pyrryl with the proviso that at least one of Ar and Ar^1 is phenyl or substituted phenyl; and R is a member of the group consisting of hydroxy, lower alkoxy and amido.

4,095,026

PYRAZOLINE COMPOUNDS HAVING INSECTICIDAL ACTIVITY

Rudolf Mulder, and Kobus Wellinga, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

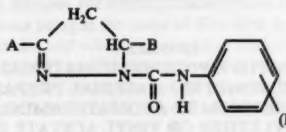
Division of Ser. No. 547,991, Feb. 7, 1975, Pat. No. 3,991,073, which is a continuation of Ser. No. 329,690, Feb. 5, 1973, abandoned. This application Aug. 19, 1976, Ser. No. 715,706

Claims priority, application Netherlands, Feb. 9, 1972, 7201674

Int. Cl.² C07D *231/06*

U.S. Cl. 548—379 **19 Claims**

1. A compound of the formula



wherein:

A is phenyl, phenyl substituted by 1 or 2 **substituents selected from the group consisting of halogen, cyano, alkyl of from** 1 to 4 carbon atoms and may be substituted by halogen, cycloalkyl, alkoxy of from 1 to 4 carbon atoms, alkylthio of from 1 to to carbon atoms and amino substituted by 1 or 2 alkyls of from 1 to 4 carbon atoms or thienyl which may be substituted by a halogen atom or a lower alkyl,

B is phenyl, phenyl substituted by from 1 to 3 substituents selected from the group consisting of a halogen atom, alkoxy consisting of from 1 to 4 carbon atoms, alkyl of from 1 to 4 carbon atoms and may be substituted by halogen, cycloalkyl, thioalkyl of from 1 to 4 carbon atoms, sulfonylalkyl of from 1 to 4 carbon atoms, dioxy alkylene of from 1 to 4 carbon atoms amino substituted by 1 or 2 alkyls each of from 1 to 4 carbon atoms furyl or thienyl which may be substituted by halogen or lower alkyl,

R_1 is halogen, alkoxy of from 1 to 4 carbon atoms, alkyl of from 1 to 4 carbon atoms and may be substituted by halogen, cycloalkyl, thioalkyl of from 1 to 4 carbon atoms, sulfonylalkyl of from 1 to 4 carbon atoms, cyano, nitro or amino group substituted by 1 or 2 alkyls,

n is 1 or 2, with the provisio that when A represents a disubstituted phenyl these substituents do not occupy the 2,6 positions of the phenyl group, and that when n is 2 the substituents represented by R_1 are not attached to the 2 and 6 positions of the phenyl group to which they are attached.

4,095,027

2-CARBALKOXY-2'-AMINOCARBONYLDIPHENYL SULFIDES

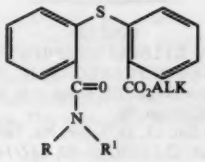
Nariman Bomanshaw Mehta, and Lawrence Edward Brieaddy, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 597,697, Jul. 21, 1975, Pat. No. 3,997,540. This application Sep. 23, 1976, Ser. No. 725,923

Int. Cl.² C07C *149/41*

U.S. Cl. 560—18 **10 Claims**

1. The compound of the formula



where R and R^1 are the same or different and are each hydrogen or lower alkyl and ALK is alkyl of 1 to 4 carbon atoms, in the above lower alkyl has 1 to 4 carbon atoms.

4,095,028

SUBSTITUTED DIOXAMIC ACID ESTERS

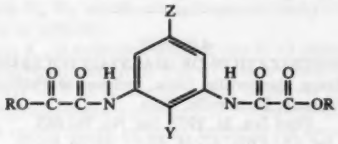
Charles M. Hall, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 382,762, Jul. 26, 1973, Pat. No. 3,993,679, which is a continuation-in-part of Ser. No. 317,005, Dec. 20, 1972, abandoned. This application Aug. 16, 1976, Ser. No. 714,572

Int. Cl.² C07C *125/00*; A61K *31/24*

U.S. Cl. 560—44 **13 Claims**

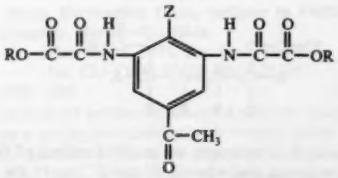
1. A compound of the formula



wherein R is alkyl of one to three carbon atoms, inclusive; Z is trifluoromethyl or

wherein D is hydrogen or alkyl of one to three carbon atoms, inclusive; Y is hydrogen, methyl or chloro, with the proviso that when Z is trifluoromethyl, Y is chloro.

10. Compounds of the formula

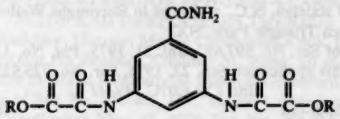


wherein R is selected from the group consisting of, alkyl of from one to three carbon atoms

Z is selected from the group consisting of hydrogen, alkyl of from one to three carbon atoms, inclusive, alkoxy of from

one to three carbon atoms, inclusive, fluoro, chloro, and bromo.

12. A compound of the formula



wherein R is alkyl of one to three carbon atoms, inclusive.

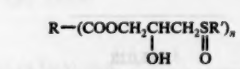
4,095,029

2-HYDROXY-3-ALKYLSULFOXYPROPYL-1 ESTERS OF ARENE POLYCARBOXYLIC ACIDS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 17, 1977, Ser. No. 760,013
Int. Cl.² C07C 69/82, 147/14
U.S. Cl. 560—87 9 Claims

1. Poly (2-hydroxy-3-alkylsulfoxypropyl-1)$_n$ esters of arene polycarboxylic acids wherein the said esters are of the formula



wherein n is 2 to 6, R is an n-valent radical derived from benzene, biphenyl, naphthalene, anthracene or phenanthrene wherein R can be substituted by nitro, halogen and alkoxy of 1 to 12 carbon atoms and R′ is selected from the group consisting of alkyl moieties containing from 1 to 22 carbon atoms, and aralkyl moieties, alkylated aryl moieties and cycloalkyl moieties containing 4 to 40 carbon atoms, the ring radicals of said moieties being selected from the group consisting of phenyl, biphenyl and cyclohexyl radicals, where R′ can be substituted with nitro, halogen and alkoxy of 1 to 12 carbon atoms.

4,095,030

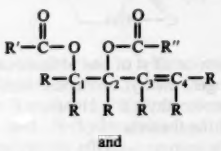
ISOMERIZATION OF DIACYLOXYOLEFINS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 21, 1977, Ser. No. 761,083
Int. Cl.² C07C 67/28, 69/02, 69/16, 69/78
U.S. Cl. 560—100 10 Claims

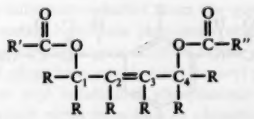
1. A process comprising:

producing a mixture by mixing at least one diacyloxyolefin represented by the general fomulas I and II as follows



(I)

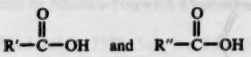
and



(II)

wherein R is hydrogen or an alkyl radical of from 1–4 carbon atoms, and wherein R′ and R″ can be the same or different and can be R or an aryl radical of from 6–10 carbon atoms, and wherein at least one of said R's attached to the carbon atoms numbered 1 and 4 in said formulas I and II is hydrogen;

a reagent selected from the group consisting of an alkali metal, an alkaline earth metal and an ammonium salt of a carboxylic acid represented by the general formulas



wherein R′ and R″ are as defined above, and

a polar diluent having a dielectric constant of at least 10 when measured at a temperature ranging from 20° C. to 30° C. and having no —OH groups so that the diacyloxyolefin is isomerized wherein the mixture is under sufficient pressure to maintain the mixture predominantly in the liquid phase.

4,095,031

PERFUMED COPOLYMERS OF ETHYLENE AND POLAR MONOMER

Edward Jacob Engle, Hockessin, Del., assignor to Polak's Frutal Works, Inc., Middletown, N.Y.

Filed Feb. 8, 1977, Ser. No. 766,631
Int. Cl.² C08K 5/00
U.S. Cl. 526—1 3 Claims

1. A thermoplastic resin body consisting essentially of a thermoplastic copolymer of ethylene and about 6 to 60% by weight of a polar vinyl monomer selected from the class consisting of

(a) vinyl acetate;
(b) ethyl acrylate;
(c) methyl acrylate;
(d) butyl acrylate; and
(e) acrylic acid and about 1 to 30% by weight of perfume oil.

4,095,032

PHOTOSENSITIVE POLYMERIC MATERIAL AND ELECTROPHOTOMETRIC MATERIAL PREPARED BY REACTING SECONDARY AROMATIC AMINE WITH VINYL ALKYLETHER OR VINYL ACETATE IN THE PRESENCE OF STRONG ACID AND HG (II) OR PB (IV) CATALYST

Ekaterina Egorovna Sirotkina, prospekt Lenina, 87, kv. 6; Vadim Petrovich Lopatinsky, prospekt Lenina, 43, kv. 10a; Viktor Dmitrievich Filimonov, ulitsa Usova, 25b, kv. 9; Rita Moiseevna Kogan, ulitsa Vershinina, 37, kv. 205; Vyacheslav Dmitrievich Pirogov, Studgorodok, 2, kv. 8; Sofya Ivanovna Kudinova, Komsomolsky prospekt, 39/2, kv. 6; Ljubov Sergeevna Sizova, ulitsa Osipenko, 31, kv. 215; Svetlana Stepanovna Reznikova, ulitsa Usova, 11a, kv. 109; Georgy Nikolaevich Ivanov, prospekt Kirova, 1, kv. 3a; Nina Alexandrovna Tsekhanovskaya, poselok Sputnik 8, kv. 316, all of Tomsk; Jonas-Donatos Bronyaus Sidaravichus, ulitsa R. Charno, 1, kv. 48, Vilnjus; Larisa Vasilievna Randina, prospekt Lenina 30, Tomsk; Svetlana Leonidovna Bocharova, prospekt Lenina 30, Tomsk; Galina Petrovna Gulyaeva, prospekt Lenina 30, Tomsk; Raisa Ivanovna Bondarenko, prospekt Lenina 30, Tomsk; Galina Ivanovna Rybalko, ulitsa Zhirmanu, 20 kv. 82, Vilnjus, and Yanina Antono Adomanite, ulitsa Antokalne, 96 kv. 75, Vilnjys, all of U.S.S.R.

Division of Ser. No. 307,224, Nov. 16, 1972, abandoned. This application Jan. 31, 1975, Ser. No. 546,187
Int. Cl.² C08F 7/12; C08J 3/00
U.S. Cl. 526—11.1 7 Claims

1. A method for preparing a photosensitive polymeric material possessing photoelectric properties comprising reacting in a medium of an organic solvent an aromatic secondary amine or mixture thereof with a heterocyclic secondary amine, with a vinyl ether of an aliphatic alcohol in the presence of a strong acid.

4,095,033

PROCESS FOR THE POLYMERIZATION OF CYCLOOLEFINS

Friedrich-Wilhelm Küpper, Marl, Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Filed Mar. 15, 1977, Ser. No. 777,798
Claims priority, application Germany, Apr. 1, 1976, 2613999
Int. Cl.[2] C08F 4/22
U.S. Cl. 526—90 10 Claims

1. In a process for the polymerization of a cycloolefin monomer of 8 or 12 carbon atoms having one or more non-conjugated double bonds in the ring with the aid of a catalyst consisting of tungsten hexachloride and a cocatalyst,

the improvement which comprises employing cis,trans-1,5-cyclodecadiene as the cocatalyst in a molar ratio to tungsten hexachloride of at least 2 : 1.

4,095,034

MANUFACTURE OF α-NAPHTHYL-N-METHYL-CARBAMATE

Dietrich Mangold, Neckargemuend; Karl-Heinz Koenig, Frankenthal, and Christian Reitel, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhein, Germany

Filed Apr. 9, 1976, Ser. No. 675,580
Claims priority, application Germany, May 2, 1975, 2519584
Int. Cl.[2] C07C 125/06
U.S. Cl. 560—134 3 Claims

1. A process for the manufacture of α-naphthyl-N-methylcarbamate by the reaction of methylcarbamyl chloride and α-naphthol containing β-naphthol as an impurity, which comprises reacting methylcarbamyl chloride, which is essentially free from phosgene and hydrogen chloride, in the absence of an acid-binding agent, with α-naphthol containing β-naphthol as an impurity at a temperature in the range of 60° to 130° C in, as solvent, cumene, the starting concentration of said naphthol in the cumene being in the range of 20 to 40% by weight, based on the cumene, and cooling the reaction mixture to precipitate the α-naphthyl-N-methylcarbamate as a pure crystalline solid, the β-naphthyl-N-methylcarbamate formed in the reaction remaining in solution in the cumene when the reaction mixture is cooled.

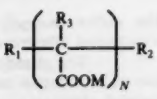
4,095,035

ALIGOMERIC POLYACRYLATES

Vincent Lamberti, Upper Saddle River, and Chester R. Willis, Mapleshade, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 461,060, Apr. 15, 1974, Pat. No. 3,922,230, which is a continuation of Ser. No. 169,101, Aug. 4, 1971, abandoned. This application Jun. 27, 1975, Ser. No. 591,220
Int. Cl.[2] C07C 69/66
U.S. Cl. 560—180 3 Claims

1. An oligomeric polyacrylate having an average molecular weight of greater than about 500 and less than about 10,000 and a formula represented by:



wherein N is a whole number interger, R_1, and R_2 are moieties which do not impair biodegradability of the molecule and are selected from the group consisting of biodegradable hydroxy containing moieties, R_3 is selected from the group consisting of hydrogen and alkyl groups having from one to six carbon atoms and M is selected from the group consisting of hydrogen, alkali metals, ammonium and substituted ammonium cations.

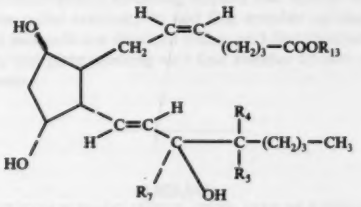
4,095,036

8β,12α,15β-PGF$_2$β COMPOUNDS

Ernest W. Yankee, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 518,695, Oct. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 289,312, Sep. 15, 1972, abandoned. This application Feb. 23, 1976, Ser. No. 660,306
Int. Cl.[2] C07C 172/00
U.S. Cl. 560—121 9 Claims

1. An optically active compound of the formula



wherein R_4, R_5, and R_7 are hydrogen or methyl, being the same or different;

wherein R_{13} is hydrogen, alkyl of one to 10 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof wherein R_{13} is hydrogen.

4,095,037

METHOD FOR THE OXIDATION OF A CONJUGATED DIOLEFIN

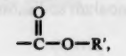
Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 8, 1976, Ser. No. 721,645
Int. Cl.[2] C07C 67/05; B01J 23/16
U.S. Cl. 560—246 11 Claims

1. A method for producing diacyloxyalkenes comprising:

reacting a conjugated diolefin with oxygen and at least one compound selected from the group consisting of a carboxylic acid and a carboxylic acid anhydride using a catalyst consisting essentially of a compound of bismuth, an alkali metal compound and a source of nitrate ion wherein the conjugated diolefin is selected from unsubstituted and substituted acyclic and cyclic compounds wherein the number of carbon atoms in the conjugated diolefin ranges

from about 4 to about 16, and the substituents are selected from the group consisting of F—, Cl—, Br—, I—, C≡N,



and monovalent hydrocarbyl radicals of up to 12 carbon atoms; —R′ is selected from the group consisting of —H, alkyl and aryl radicals of up to 10 carbon atoms; the carboxylic acid and carboxylic acid anhydrides are selected from the group consisting of mono and dicarboxylic aliphatic and aromatic acids and acid anhydrides having from about 2 to about 18 carbon atoms per molecule; the bismuth compound is selected from the group consisting of oxides, nitrates, halides and mixtures thereof; the alkali metal compound is selected from the group consisting of halide, carboxylate, oxide, nitrate and mixtures thereof, and the source of nitrate ion is provided by an inorganic compound in which the cationic portion of the compound is essentially inert to the oxidizing conditions employed if said cationic portion is other than bismuth or an alkali metal.

4,095,038

OPTICALLY ACTIVE CYCLOHEXANE DERIVATIVES

Walter Boguth, Riehen; Hans Georg Wilhelm Leuenberger, Arlesheim; Hans Johann Mayer, Fullinsdorf; Erich Widmer, Munchenstein, and Reinhard Zell, Rodersdorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

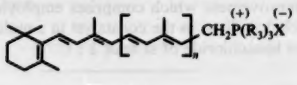
Division of Ser. No. 601,770, Aug. 4, 1975, Pat. No. 3,988,205. This application Jul. 20, 1976, Ser. No. 707,146

Claims priority, application Switzerland, Aug. 21, 1974, 11434/74; Nov. 1, 1974, 14674/74; Jul. 15, 1975, 9303/75

Int. Cl.[2] C07C *175/00*

U.S. Cl. 560—255 **3 Claims**

1. A compound of the formula



wherein R_3 is phenyl, X is halogen and *n* is an integer from 0 to 1.

4,095,039
POWER CABLE WITH IMPROVED FILLING COMPOUND

Paul F. Thompson, Millington, N.J., assignor to General Cable Corporation, Greenwich, Conn.

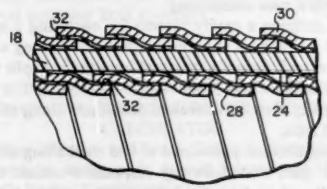
Filed Apr. 16, 1976, Ser. No. 677,531
Int. Cl.[2] H01B 7/28, 7/18
U.S. Cl. 174—23 C 13 Claims

1. A high voltage, power transmission cable including a conductor surrounded by insulation material, a filler in contact with the conductor on the outside thereof and in any interstices of the conductor and between the conductor and the insulation material, the filler being a low molecular weight isobutylene rubber compounded with sufficient electrically conductive carbon to make the filler semi-conducting and of a putty-like consistency with good adhesiveness to the conductor and the insulation material at room temperature, the electrically conductive carbon being greater than 29% by weight of the filler, the filler having retention of its flexibility and adhesiveness in spite of repeated heating and cooling resulting from load cycling of the high voltage power transmission cable, said filler contacting with the conductor and insulating material and preventing migration of moisture lengthwise along the conductor and insulating material, the filler consisting essentially of the isobutylene rubber, and the electrically conductive material and possible trace materials.

4,095,040
GAS INSULATED TRANSMISSION LINE HAVING LOW INDUCTANCE INTERCALATED SHEATH

Alan H. Cookson, Southboro, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 10, 1976, Ser. No. 740,445
Int. Cl.[2] H01B 9/02
U.S. Cl. 174—28 8 Claims

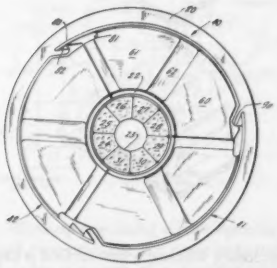


1. A gas insulated transmission line comprising:
an elongated cylindrical outer sheath having a radial inner radius;
an elongated, cylindrical inner conductor disposed within said outer sheath, said inner conductor having a radial outer radius;
an insulating gas disposed within said outer sheath, said insulating gas electrically insulating said inner conductor from said outer sheath; and
at least one spacer assembly disposed within said outer sheath, said spacer assembly insulatably supporting said inner conductor within said outer sheath, said spacer assembly comprising:
a first member having a radial shape defined along its radial extremities by an inner radius substantially the same as said inner conductor outer radius and by an outer radius being substantially the same as said outer sheath inner radius, said first member along its inner radial extremity extending for an arc distance of 180°, said first member being disposed intermediate said inner conductor and said outer sheath, said first member inner radial extremity being positioned adjacent said inner conductor, said first member having a pair of cavities therein extending inwardly from said outer radial extremity;
a second member having a radial shape defined along its radial extremities by an inner radius substantially the same as said inner conductor outer radius and by an outer radius less than said outer sheath inner radius, said second member being disposed intermediate said inner conductor and said outer sheath, said second member inner radial extremity extending for an arc distance of 180° and being positioned adjacent said inner conductor, said first and second member outer radial extremities together extending for an arc distance of 360°; and
a curved plate having inner and outer radial extremities defined by an inner radius substantially the same as said second member outer radius and by an outer radius substantially the same as said outer sheath inner radius, said plate being positioned intermediate said second memer and said outer sheath, said plate having an inwardly projecting nub at each circumferential end thereof, said plate circumferentially extending beyond said second member outer radial extremity to said first member cavities such that said nubs are disposed within said first member cavities, said plate securing said first member to said second member.

4,095,041
MULTIPLE PART INSULATOR FOR FLEXIBLE GAS-INSULATED TRANSMISSION LINE CABLE

Philip C. Netzel, Milmont Park, and Jonathan Z. Ponder, Lansdale, both of Pa., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Jun. 21, 1977, Ser. No. 808,707
Int. Cl.[2] H01B 9/04
U.S. Cl. 174—28 18 Claims

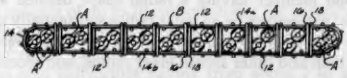


1. An insulator support disk for supporting the central conductor of a gas-insulated transmission line within an outer grounded housing which is coextensive with said central conductor; said insulator support disk consisting of a plurality of identical pie-shaped segments, each extending over an angle less than 180° around said central conductor, and each having a central axial extending rim for gripping the central conductor of a transmission line, an axially extending outer rim for gripping the interior of the housing of a transmission line, and a central web extending between said outer rim and said central rim, and means for securing said plurality of segments to one another to define a continuous support disk.

4,095,042
WOVEN SHIELDED CABLE

Edgar A. Ross, Greenville, S.C., assignor to Southern Weaving Company, Greenville, S.C.

Filed Sep. 7, 1976, Ser. No. 720,964
Int. Cl.[2] H01B 7/08
U.S. Cl. 174—36 8 Claims



1. A woven shielded cable comprising:

a plurality of elongated conductor wires extending longitudinally in said cable each said wire having a coating of insulation;

a substantially solid outer woven cover formed from metallic fiber strands woven about said conductor wires isolating said wires from external electromagnetic interference;

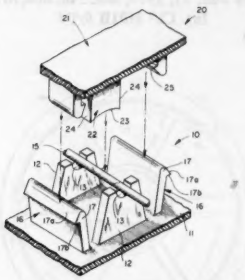
said woven cover including at least one metallic warp binder strand woven between adjacent conductor wires to separate and shield at least one of said conductor wires between adjacent warp binder strands for reducing internal interference between conductor wires; and a metallic fill strand woven about said conductor wires and said warp binder strand;

whereby said conductor wires are uniformly shielded from external and internal interference.

4,095,043
ENCLOSURE WITH STRAIN RELIEF

Harold B. Martin, West Caldwell, and Erwin O. Wagner, Kenilworth, both of N.J., assignors to Graber-Rogg, Inc., Cranford, N.J.

Filed May 14, 1976, Ser. No. 686,476
Int. Cl.[2] H01R 13/58
U.S. Cl. 174—65 R 2 Claims



1. In an enclosure wherein a first surface is capable of being connected independently to a second surface to form the assembled enclosure, a strain relief formed by the connection of said surfaces for holding a power cord when extending from the interior of said enclosure which comprises:

a pair of spaced posts each extending from the first surface and each terminating in a free end, each post of said pair of spaced posts having within its free end a recess for receiving and captivating a power cord therein,

a post extending from said second surface and terminating in a free end, said second surface post being of a length sufficient to enter into the space between said pair of spaced posts when the first and second surfaces are joined,

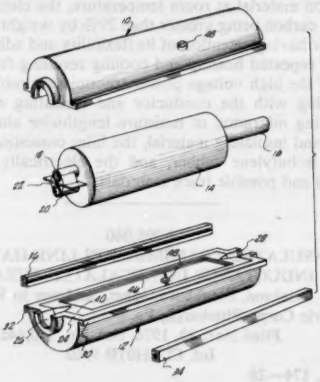
all of said posts cooperating to engage, deform and hold a power cord in a path defined by their free ends when the first and second surfaces are joined and the second surface post is located in the space between the first surface posts, and

means integrally associated with said first and second surfaces for securely holding the first and second surfaces together simultaneously to form the enclosure, said means including a latching member located on either side of the first surface posts and extending perpendicularly thereto, each latching member having a hook thereon for engagement with latch receiving means on the second surface.

4,095,044
MULTIPLE CABLE ADAPTER AND SPLICE CASE INCLUDING THE SAME

David August Horsma, Palo Alto, Calif., and Francis De Blauwe, Lubbeek, Belgium, assignors to Raychem Corporation, Menlo Park, Calif.

Filed Oct. 26, 1976, Ser. No. 735,587
Int. Cl.[2] H02G 15/10, 15/18
U.S. Cl. 174—138 F 10 Claims



1. A splice case comprising

a shell defining a cavity therein for enclosing a splice, said shell including a longitudinal split and having an opening at one end thereof along said longitudinal split to receive in-coming cable;

a thermally responsive sealant positioned along said longitudinal split;

a heating element positioned in said shell along said longitudinal split, said thermally responsive sealant being outwardly of said heating element to seal said shell upon heating of said heating element; and

an adapter of thermally responsive sealant sized to fit in said opening, said adapter having a plurality of channels extending the length of said adapter for receipt of cables extending into said shell and a sheet exhibiting high thermal conductivity extending from said insert into said split in said shell for heat conduction from said heating element to said adapter.

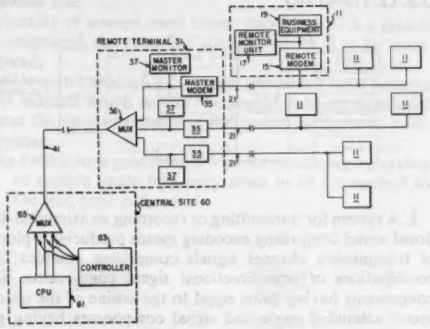
6. An adapter for sealing a plurality of cables in an access opening of a splice case, comprising

a body of hot melt sealant sized to fit in the access opening of the splice case, said body having a plurality of channels extending the length thereof for receipt of cables extending to the splice case, and a sheet exhibiting high thermal conductivity extending from said body outwardly to enhance thermal conductivity between the splice case and said body.

4,095,045
METHOD AND APPARATUS FOR SIGNALING IN A COMMUNICATION SYSTEM

Charles P. Johnson, Westport, and Frederick A. Lucas, Brookfield, both of Conn., assignors to General DataComm Industries, Inc., Wilton, Conn.

Filed Jan. 19, 1977, Ser. No. 760,666
Int. Cl.[2] H04L *11/00*
U.S. Cl. 178—2 R 36 Claims



1. In a digital communication system using data and control signals and comprising a signal source, at least one communication channel and at least one terminal, a signal detection method comprising the steps of:

detecting a first signal event transmitted from said signal source to said terminal;

detecting a second signal event transmitted from said signal source to said terminal, said second signal event being detected within a specified time interval commencing after said first event;

detecting thereafter at least one additional signal event transmitted from said signal source to said terminal, said additional signal event being detected within a time limit related to either said first or said second event, at least one of said first, second and additional signal events occurring in a control signal; and

producing an output signal indicating that said second event and said additional event were detected within the time interval and time limit specified.

4,095,046
ELECTRONIC ENCIPHERING- AND DECIPHERING APPARATUS IN THE FORM OF A POCKET CALCULATOR

Peter Frutiger, Wangen, and Bruno Gemperle, Steinhausen, both of Switzerland, assignors to Anstalt Europaische Handelsgesellschaft, Vaduz, Liechtenstein

Filed Nov. 1, 1976, Ser. No. 737,285
Claims priority, application Switzerland, Nov. 11, 1975, 14587/75
Int. Cl.[2] H04K *1/02;* H04L *9/02*
U.S. Cl. 178—22 20 Claims

1. An integrated enciphering and deciphering apparatus having a size and shape adapted to be hand held, said apparatus comprising:

A. input means for entering key and text data to be processed;

B. mode select means for selectively placing said apparatus in either a text data entry mode, a key data entry mode, a text data display mode, and enciphering mode or a deciphering mode;

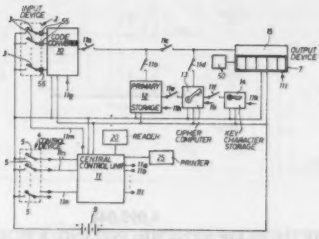
C. primary storage means for storing text data entered by said input means when said apparatus is in said text data entry mode;

D. key storage means for storing key data entered by said input means when said apparatus is in said key data entry mode;

E. output means for displaying data applied thereto;

F. cipher computer means for respectively enciphering and deciphering said text data stored in said primary storage means as a function of said key data stored in said key storage means when said apparatus is in said enciphering and deciphering modes;

G. circuit control means for;



1. causing said text data to be applied to said output means as it is entered by said input means when said apparatus is in said text data input mode;

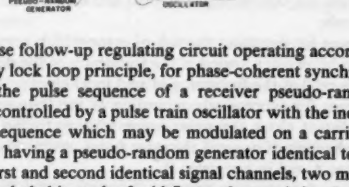
2. causing said stored text data to be applied to said output means when said apparatus is in said text data display mode; and

3. causing said enciphered and deciphered data to be applied to said output means when said apparatus is in said enciphering or deciphering modes, respectively.

4,095,047
PHASE REGULATING CIRCUIT

Klaus von Pieverling, Wolfratshausen; Hermann Sepp, Munich, and Walter Baier, Kaiserslautern, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 1, 1976, Ser. No. 737,534
Claims priority, application Germany, Nov. 7, 1975, 2549955
Int. Cl.[2] H04L *7/04*
U.S. Cl. 178—69.1 8 Claims



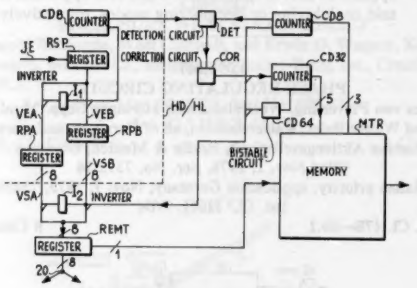
1. A phase follow-up regulating circuit operating according to the delay lock loop principle, for phase-coherent synchronization of the pulse sequence of a receiver pseudo-random generator controlled by a pulse train oscillator with the incoming pulse sequence which may be modulated on a carrier, a transmitter having a pseudo-random generator identical to the receiver, first and second identical signal channels, two mixers with one included in each of said first and second signal channels and each controlled by the pulse sequence output of the receiver pseudo-random generator, two filtering networks respectively receiving the outputs of said two mixers, said first and second signal channels having their inputs connected in parallel, a difference forming device receiving the output signals of said first and second signal channels from said two filtering networks, a loop filter receiving the output of said difference forming device, a voltage controlled oscillator which is controllable in frequency receiving an input from said

loop filter and supplying an input to said receiver pseudo-random generator, further including a first commutator switch receiving two outputs of said receiver-end pseudo-random generator and supplying inputs to said two mixers and a second commutator switch receiving the outputs of said two filtering networks and supplying inputs to said difference forming device and a pulse train oscillator for switching said two commutator switches back and forth between their two switching states periodically and in synchronism with a pulse train from said pulse train oscillator.

4,095,048
METHOD OF SYNCHRONIZING A PULSE CODE MODULATION (PCM) JUNCTION AND AN ARRANGEMENT FOR APPLYING THIS METHOD

Claude Athénes, and Jean Pierre Landez, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 15, 1976, Ser. No. 696,197
Claims priority, application France, Jun. 17, 1975, 75 18960
Int. Cl.² H04L *7/00*
U.S. Cl. 178—69.1 **3 Claims**



1. In a PCM switching network wherein time intervals comprise *n* bits, a junction synchronization system in a local switching center equipped with a local clock connected with a distant switching center equipped with a distant clock, comprising:

means for comparing said local and said distant clock signals;

means for detecting the risk of error which occurs when a n-bit register loaded at the frequency of the distant clock is read at the frequency of said local clock;

means for successively recording at the frequency of said distant clock the pulse trains relating to the successive channels of one and the same frame alternately in a register A and in a register B;

means for counting the time intervals at the frequency of said local clock and determining the time of correction;

means for carrying out said correction by repeating the reading of one of the two registers A and B at the frequency of said local clock;

means for recording the time intervals in a frame memory;

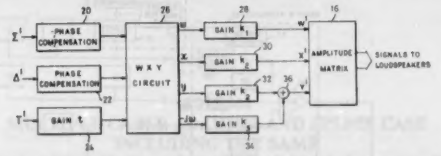
means for detecting the loss of a frame locking code; and

means for shifting the pulse trains recorded in said registers A and B in successive jumps of one bit until said frame locking code is detected.

4,095,049
NON-ROTATIONALLY-SYMMETRIC SURROUND-SOUND ENCODING SYSTEM

Michael Anthony Gerzon, Oxford, England, assignor to National Research Development Corporation, London, England

Filed Mar. 11, 1977, Ser. No. 776,916
Claims priority, application United Kingdom, Mar. 15, 1976, 10191/76; Jan. 22, 1977, 2686/77
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **22 Claims**



1. A system for transmitting or recording an aximuthal directional sound comprising encoding means producing a plurality of transmission channel signals comprising complex linear combinations of omnidirectional signal components, signal components having gains equal to the cosine of the encoded sound azimuthal angle and signal components having gains equal to the sine of the encoded sound azimuthal angle, the encoding means comprising a phase-amplitude matrix arranged to produce first, second and third transmission channel signals, the first and second transmission channel signals having gains for sounds associated with an azimuth angle θ which are respective independent linear combinations of Σ_{gain} and Δ_{gain} given by:

$$\Sigma_{gain} = a + c\cos\theta + je\sin\theta$$
$$\Delta_{gain} = jb + jd\cos\theta + f\sin\theta$$

where $j (= -1)$ represents a 90+ **phase shift and where** *a, b, c, c, e* and *f* are real gains such that, for any chosen angle θ', the quantities given substantially by:

$$h = \nu^{-1}\left(\frac{1 + u^2\sin^2\theta'}{1 - (u/\nu)^2\cos^2\theta'}\right)^{\frac{1}{2}}$$

$$g = \frac{h^2}{1 + \nu h}\left(\frac{u(\cos^2\theta' + \nu^2\sin^2\theta'}{1 + u^2\sin^2\theta'}\right)$$

where:

$$u = cf + ed/bc - ad\ \nu = -be + af/bc - ad$$

are such that $1 - 0\ (u/\nu)\cos^2\theta'$ is positive and that the pair (u, ν) has neither of the values (0, 1) and (0, −10, the third transmission channel signal having a gain T_{gain} given by:

$$T_{gain} = q\,(jg + jh\cos\theta + i\sin\theta)$$

where q is a non-zero complex gain, g and h are real gains and $= -1$.

4,095,050
MONITOR AND CONTROL SYSTEM

Ronald Beachem, Mound, and Dennis Covington, Minneapolis, both of Minn., assignors to Leon O. Shaw, Minneapolis, Minn.

Filed Apr. 19, 1976, Ser. No. 678,237
Int. Cl.² H04M *11/00*
U.S. Cl. 179—2 A **29 Claims**

1. A remote monitoring device connectable to a telephone line to be used with a system having a plurality of system components which can be called by a telephone caller on any telephone and controlled by frequency signals transmitted by the telephone caller over the telephone line, comprising:

sensing means connected to the telephone line for sensing a ringing signal transmitted over the telephone line;

line seize means for connecting the device to the telephone line after a ringing signal has been sensed by the sensing means;

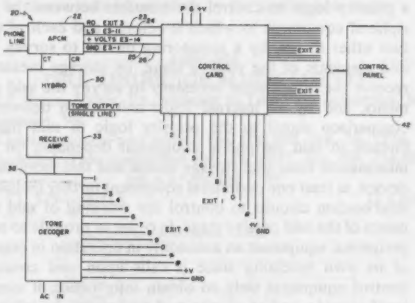
receiving means for receiving the frequency signals transmitted by the telephone caller oer the telephone line;

decoding means connected to the receiving means for decoding the frequency signals transmitted over the telephone line;

a plurality of sensors, each sensor associated with a system component, the operating status of which is to be monitored;

audible sound producing means for producing tonal patterns to indicate which system component is being monitored and the operating status of the system component, comprising;

an audible tone producing device for producing a plurality of audible single frequency tones to be transmitted to the telephone caller; and



a tone varying device connected to the sensors for causing a variation in the tones produced by the tone producing device depending on the operating status of the system component being monitored by the selected sensor;

programmable logic means for selectively monitoring the operating status of selected system components according to predetermined frequency signals transmitted over the telephone line by the telephone caller, comprising;

gating means connected to and controlled by the decoding means and connected to the sensors and the sound producing means so that different audible single frequency tones are produced by the tone producing device for each sensor and the tonal pattern is controlled by the tone varying device depending on the operating status of the system component being monitored by the selected sensor; and

transmitting means for transmitting the audible tones produced by the sound producing means to the telephone line whereby the operating status of each selected system parameter being monitored is transmitted to the listener.

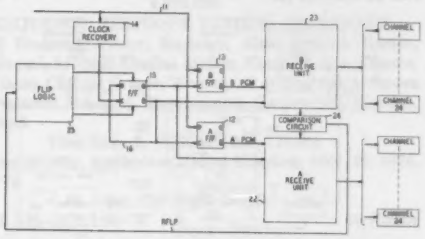
4,095,051

DEMULTIPLEXER CIRCUIT

Charles R. Crue, West Newbury, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 15, 1976, Ser. No. 750,903
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS **5 Claims**

1. In a communication system wherein a pair of n-channel digroup signals, each of which includes framing bits, are synchronously multiplexed into a composite signal by bit interleaving the digroup signals, a demultiplexer comprising a pair of gating means to which the composite signal is coupled, means for recovering the timing of said composite signal and for generating therefrom a pair of phase inverted clock signals each at the digroup bit rate, means for respectively coupling said clock signals to said gating means to alternately enable the same and thereby steer the interleaved digroup bits of said composite signal to separate digroup receive units, means for comparing the relative timing of the bits coupled to each of the receive units and for generating a predetermined signal when the digroup bit streams are being sent to the wrong receive



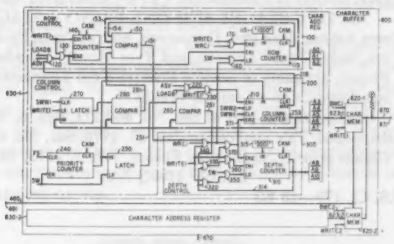
units, means responsive to said predetermined signal to advance the phase of one clock signal and retard the phase of the other by a preselected amount to thereby effectively phase reverse said clock signals and reverse the steering of the digroup bit streams, and means for avoiding loss of frame in either receive unit when the steering of the digroup bit streams is reversed.

4,095,052

DIGITAL SPEECH INTERPOLATION TRUNK PRIORITY ROTATOR

Yau-Chau Ching, Morganville, and David Gavin Messerschmitt, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 2, 1977, Ser. No. 821,242
Int. Cl.[2] H04J *6/02*
U.S. Cl. 179—15 AS **6 Claims**



1. Apparatus for providing a priority rotation to digitized message samples;

said apparatus including an input terminal adapted to receive said samples from a plurality of trunks;

activity status means for signalling which ones of said trunks are active and which ones are inactive;

means for buffering said received samples;

means for assigning active samples from said buffer to a frame;

an output terminal adapted to transmit said frame;

overload mitigating means operable on said assigned samples during overload; and

CHARACTERIZED IN THAT said apparatus further comprises;

means responsive to active trunks for adaptively adjusting a sample assignment starting point,

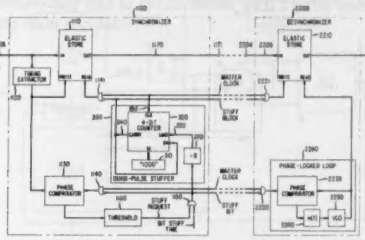
said starting point being adjusted on a frame-by-frame basis according to which trunks are active during said frame whereby a substantially uniform signal degradation is obtained during overload.

4,095,053

QUASI-PULSE STUFFING SYNCHRONIZATION

Donald Lars Duttweiler, Colts Neck, and Allan Michael Hofmann, Jackson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 1, 1977, Ser. No. 829,664
Int. Cl.[2] H04J 3/06
U.S. Cl. 179—15 AF **4 Claims**



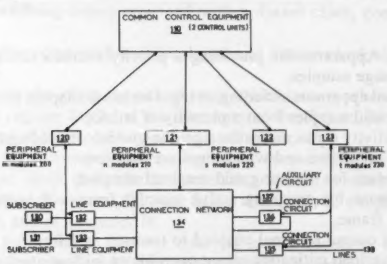
1. Synchronization apparatus including apparatus for extending a digital signal from an input terminal through an elastic store to an output terminal and including pulse stuffer apparatus coupled to said extending apparatus for providing a stuff bit signal responsive to the detection of a request to insert a pulse in said digital signal, and CHARACTERIZED IN THAT said synchronization apparatus further comprises quasi-pulse stuffing means for mitigating signal distortion, said quasi-pulse stuffing means including means for detecting a predetermined number of said stuff bit signals, means responsive to the detection of said predetermined number for providing a stuff block signal, means responsive to said stuff block signal for stuffing a block in said digital signal and means adapted for extending said stuff block and said stuff bit signals to a desynchronizer.

4,095,054

ELECTRONIC TELEPHONE SWITCHING SYSTEM OF THE STORED PROGRAM TYPE COMPRISING TWO ACTIVE STAGES AND ONE PASSIVE STAGE

Pierre Anizan; Jean Paul Ducournau, both of Paris; Paul Gilberton, Saint-Ouen-l'Aumone, and Yves Mevel, Colombes, all of France, assignors to Societe Francaise des Telephones Ericsson, Saint-Ouen-l'Aumone, France

Continuation-in-part of Ser. No. 440,272, Feb. 6, 1974, abandoned. This application Jan. 27, 1976, Ser. No. 652,760
Claims priority, application France, Feb. 8, 1973, 73.04548
Int. Cl.[2] H04Q 3/54
U.S. Cl. 179—18 ES **14 Claims**



1. An improved electronic telephone switching system of the stored program type, connected to a trunk-telephone network, including first and second active stages and one passive stage each constituted by several elements, in which

(a) said first active stage comprises a common control equipment responsible solely for information processing and formed by at least one control unit each comprising at least one program memory to allow an independent control of peripheral circuits in the second active stage and to receive information from them and an instruction library, and one data memory divided in distinct zones containing only temporarily the information required for the connections in the course of establishment and connected to said program memory, and by a plurality of liaison circuits connected to said data memory and comprising registers, in order that the control unit forms a self-contained equipment adapted to route all the traffic of the telephone installation by means of the programs recorded in the memory,

(b) said second active stage comprises independent individual peripheral equipments each with at least a program, including scanning, decision-taking, control and marking means to cooperate with respect to said passive stage, each peripheral equipment serving as interface between said first active stage and independent elements of the said passive stage and each being formed at least by liaison circuits to realize the connection between the said peripheral equipments and the said liaison circuits in the said common control equipment and comprising a register and a priority logic to control the transfers between the peripheral equipment to which it belongs and each of said two other stages, by a monitoring device to survey the said elements of the passive stage, by storage means to receive the information necessary to survey the said elements, and by an internal logic unit which delivers a comparison signal to the priority logic of said liaison circuits in said peripheral equipment depending on the information from said storage means and said monitoring device, at least one peripheral equipment further including intervention circuits to control the working of said elements of the said passive stage, in order to provide to each peripheral equipment an autonomy in operation in respect of its own speciality since it calls upon said common control equipment only to obtain information it cannot itself provide, and to give to said equipment the information useful to the other peripheral equipment relative to the connection network,

(c) said first active stage is linked to said passive stage through said second active stage which is directly connected to said passive stage, and

(d) said passive stage comprises a conversion network including independent elements each respectively connected to one of said peripheral equipments in the second active stage, these elements being line equipments, one connection network, auxiliary circuits, local connection circuits, and connection circuits to connect said switching system to a trunk network, said line equipments, auxiliary circuits, local connection circuits and connection circuits to connect to the trunk network being connectable to each other through said connection network in order to effect the routing of the telephone traffic by means of the programs stored in the program memory.

4,095,055

MULTI-STAGE SWITCHING NETWORK IN A TELECOMMUNICATION SWITCHING SYSTEM

Kazuhiko Gotoh, Fuchu; Hiroshi Kawashima, Kodaira, and Tsuyoshi Katayama, Hachioji, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

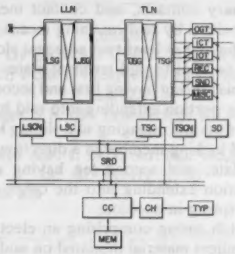
Filed Nov. 11, 1976, Ser. No. 740,822
Claims priority, application Japan, Nov. 17, 1975, 50-137952
Int. Cl.[2] H04Q 3/42, 3/52
U.S. Cl. 179—18 GF **3 Claims**

1. A multi-stage switching network in a telecommunication switching system having a path selection system which is independent of the switching network, comprising a degenerative type switching network including:

a virtual link frame comprised of a plurality of virtual switches,

means for inserting said link frame into any specified inter-

mediate stage of said multi-stage switching network according to the switching system size required by the application range of telephone traffic,

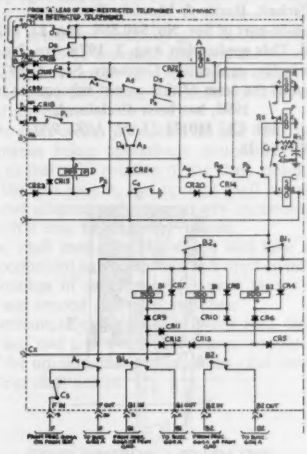


said virtual switches being normally closed and being arranged to form fixed crosspoints, whereby the stage size of real switches in said multi-stage switching network can be incremented according to the application range.

4,095,056
TOLL RESTRICTOR ACCESS CIRCUIT

Joel J. Ewen, Lithia, Va., assignor to Tele-Path Industries, Inc., Roanoke, Va.

Continuation-in-part of Ser. No. 506,602, Sep. 16, 1974, abandoned. This application Feb. 28, 1977, Ser. No. 774,089
Int. Cl.² H04M 1/66
U.S. Cl. 179—18 DA **12 Claims**



1. A toll restrictor access circuit for use with at least one toll restrictor which may be shared by a group of telephone lines comprising:

access means connected to said toll restrictor and enabled by the initiation of a telephone call from a restricted telephone instrument on one of said telephone lines for connecting said toll restrictor to the telephone line, said toll restrictor thereafter monitoring said telephone line to detect a dial tone,

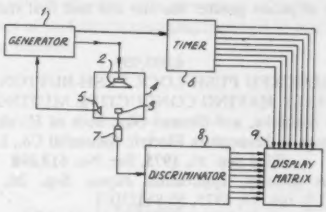
polarity-reversal means connected to the telephone line of the restricted telephone for normally disabling the telephone dial but responsive to said toll restrictor after the detection of a dial tone for reversing the polarity of the telephone line and enabling the telephone dial, and

restrict means controlled by said toll restrictor for disconnecting the restricted telephone from the telephone line in the event that a prohibited number is dialed and detected, said restrict means also causing said polarity reversal means to resume its normal condition to prevent further operation of the telephone dial and releasing said toll restrictor for use by another telephone line.

4,095,057
FREQUENCY RESPONSE TESTING APPARATUS

Ronald Frederick Power, Rayleigh; Alan Anthony Barker, Gravesend; Michael Charles Martin, Kingston-upon-Thames, and Brian Clifford Grover, Woking, all of England, assignors to National Research Development Corporation, London, England

Filed Mar. 9, 1977, Ser. No. 775,941
Claims priority, application United Kingdom, Mar. 19, 1976, 11182/76
Int. Cl.² H04R 29/00
U.S. Cl. 179—175.1 A **11 Claims**



11. Frequency response testing apparatus comprising:

a waveform generator for providing an electrical signal having a linearly increasing frequency, representative of an input for application to a device to be tested;

means responsive to a signal indicative of the output signal of said device for generating a signal indicative of the amplitude of said device output signal;

a matrix of electrically-operable light-emitting elements, interconnected in columns and rows; and

means responsive to a signal indicative of said increasing frequency signal and said signal indicative of said device output signal, for selectively activating respective elements in said matrix disposed in columns in accordance with said frequency varying signal and rows in accordance with said tested device output signal amplitude, to provide thereby a display of the frequency response of said tested device.

4,095,058
TELEPHONE SWITCHING SYSTEM TEST SET

Orrin Bernard O'Dea, Garden Grove, Calif., assignor to Communication Mfg. Company, Long Beach, Calif.

Filed Jan. 7, 1977, Ser. No. 757,625
Int. Cl.² H04M 3/22, 1/26
U.S. Cl. 179—175.2 D **34 Claims**

1. A variable number of pulses generating circuit comprising:

pulse initiating means;

a multiple state circuit having first and second states;

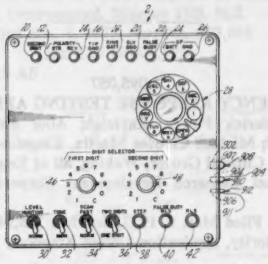
means for delivering a pulse for each occurrence of said first state;

counting means for counting the occurrence of said second state;

means for indicating a desired number of pulses, including one or more than one;

means for enabling the first state of said multiple state circuit

either responsive to said pulse initiating means or for each occurrence of said second state; and



means for enabling said second state of said multiple state circuit upon the concurrence of such indication of a number of pulses greater tha one and said first state.

4,095,059

INTERLOCKED PUSH-LOCK PUSH-BUTTON SWITCH ASSEMBLY HAVING CONDUCTIVE MUTING SPRING

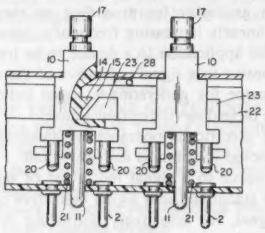
Matsuo Nishioka, and Shunzo Oka, both of Hirakata, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

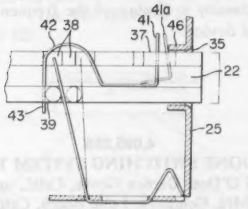
Filed Sep. 16, 1975, Ser. No. 613,898

Claims priority, application Japan, Sep. 20, 1974, 49-114246[U]; Jun. 19, 1975, 50-84323[U]

Int. Cl.[2] H01H *9/26, 13/72, 1/18*

U.S. Cl. 200—5 B **12 Claims**





9. An interlocked pushbutton switch assembly, comprising a terminal plate having a plurality of pairs of stationary contacts mounted thereon;

a housing adjacent said terminal plate;

a sliding locking member within said housing, said member being mounted for sliding movement parallel to said terminal plate and having a plurality of locking means thereon;

a plurality of operating members within said housing and mounted for vertical movement in a direction normal to said terminal plate, each of said operating members having locking means adjacent a corresponding locking means of said sliding locking member, each of said operating members having at least one movable-contact-member retaining means formed therein adjacent said terminal plate;

an inverted U-shaped movable contact member having two movable contacts adjacent corresponding ones of a pair of said stationary contacts, said contact member being retained in position by said retaining means;

said housing having at least two adjacent slots elongated in a direction parallel to said terminal plate;

an L-shaped bias spring having first and second leg portions, said first leg portion extending into said housing through one of said slots and engaging said sliding locking member to urge said locking member in a direction parallel to said terminal plate, said second leg having an inverted V-shaped portion extending into the other of said slots to retain said spring in position;

a muting switch spring comprising an electrically conductive and resilient material mounted on said sliding locking member for movement therewith, said housing having an electrically conductive part, one end of said muting spring being disposed adjacent said part for electrical contact therewith when said sliding locking member is displaced as a result of engagement of said locking means thereof with the locking means of one of said operating members; and

means for providing an electrical connection to a portion of said muting spring remote from said end thereof.

4,095,060

SLIDE SWITCH ASSEMBLY HAVING TERMINALS FOR MOUNTING SWITCH HOUSING SIDEWALL PARALLEL TO A PRINTED CIRCUIT BOARD

Jaroslav Keprda, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

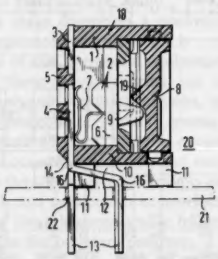
Continuation-in-part of Ser. No. 540,558, Jan. 13, 1975, Pat. No. 3,974,346. This application Aug. 2, 1976, Ser. No. 710,878

Claims priority, application Germany, Sep. 5, 1975, 2539581

The portion of the term of this patent subsequent to Aug. 10, 1993, has been disclaimed.

Int. Cl.[2] H01H *15/02, 1/00, 9/02*

U.S. Cl. 200—16 D **2 Claims**



1. In a switch assembly of the type incorporating a plurality of slider switches arranged each one next to another in a block-shaped, elongated housing having generally spaced, parallel side walls, and end walls, and a floor joining said side walls and end walls, each of said slider switches being independently activatable transversely to the longitudinal extension of said housing and parallel to said floor of said housing, and each one having a pair of fixed contacts inset into said floor, each of said contacts being connected in one piece to a terminal connection element which is provided for plugging into holes of a carrier plate, the improvement which comprises having a side wall of such housing extend perpendicularly to the floor thereof, and providing such side wall with a plurality of outwardly extending spacer bodies which extend parallel to said floor and are distributed over side wall edge portions, and further having said terminal connection elements extend from said sidewall in the same direction as said spacer bodies and terminate in a predetermined pattern, said terminal connection elements

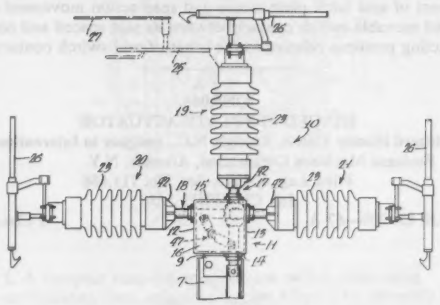
extending out of said housing coplanarly from said contacts, and being offset from one connection element to another in a staggered manner in the area which is fenced by said spacer bodies.

4,095,061

GROUP OPERATED CIRCUIT DISCONNECT APPARATUS FOR OVERHEAD ELECTRIC POWER LINES

Ronald P. Bridges, 9 S. 681 Brookeridge Rd., Downers Grove, Ill. 60515

Filed Apr. 1, 1977, Ser. No. 783,940
Int. Cl.² H01H *31/00*
U.S. Cl. 200—48 KB **14 Claims**



1. A group operated electric circuit disconnect apparatus for a plurality of overhead electric power distribution lines carried on poles, said apparatus comprising, in combination:

a base adapted to be mounted adjacent the top of a pole;

a first disconnect switch surmounting the base;

second and third disconnect switches mounted at opposite sides of the base;

an upright shaft means journalled on said base, said upright shaft means being operatively connected to said first switch so that axial rotation of the shaft means opens and closes the first switch, said upright shaft means having a lower end adapted to be operatively connected to means by which it may be manually rotated;

transverse shaft means journalled on said base and operatively connected to said second and third switches so that axial rotation of said transverse shaft means opens and closes said second and third switches;

and a mechanical connection between said upright shaft means and said transverse shaft means so that axial rotation of the upright shaft means causes axial rotation of the transverse shaft means.

4,095,062

STOP-MOTION APPARATUS

Richard J. Savageau, Seneca, S.C., assignor to Platt Saco Lowell Limited, Helmshore, England

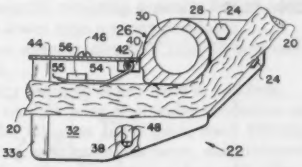
Filed Sep. 3, 1976, Ser. No. 720,508
Int. Cl.² B65H *25/14*; D01G *31/00*; D01H *13/16*
U.S. Cl. 200—61.13 **12 Claims**

1. Stop-motion apparatus for use with a convergent running array of a pluarlity of adjacent textile sliver strands, said apparatus comprising:

a plurality of strand engaging members;

strand separating and guiding means mounting said strand engaging members in adjacent relationship to each other and to respective ones of said strands for pivotal movement independent of one another between first and second positions, each of said strand engaging members being supported in its first position by engagement with an associated one of said strands, and being movable when unsupported to its second position;

said strand separating and guiding means having a magnetically actuable stop-motion switch element mounted therein adjacent said second position of an intermediate each two of said strand engaging members, and having strand divergent means for diverting each strand in a direction away from that of said convergence of said array; and



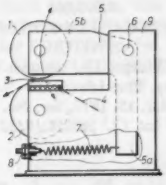
magnetic means carried by each of said strand engaging members and movable therewith for actuating said stop-motion switch element upon movement of either of adjacent ones of said strand engaging members to said second position thereof.

4,095,063

DETECTION DEVICE FOR PAPER OR FILM IN WEB FORM

Peter Herzhoff, Leverkusen; Hans Gref, Cologne, and Wolfgang Schweicher, Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 8, 1976, Ser. No. 664,497
Claims priority, application Germany, Mar. 11, 1975, 2510451
Int. Cl.² B65H *25/14*
U.S. Cl. 200—61.13 **5 Claims**

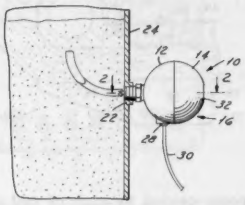


1. A device for mechanically detecting local thickenings in a web, comprising a guide roller; a sensor roller arranged with its axis of rotation parallel to the guide roller and mounted on a pair of pivotal levers for movement away from the guide roller; a stop provided on each pivotal lever and engageable with a support to determine a minimum gap between the guide roller and the sensor roller through which in use the web is guided, each stop and its associated support forming an electrical switch; an electrical circuit including both switches and a source of electrical power, the circuit being such that the flow of current is temporarily interrupted when one or both stops is lifted off its respective support when a thickening passes through the gap, drive means for the guide and sensor rollers which are constructed and arranged for driving the rollers in directions counter-current to each other whereby their direction of travel in portions adjacent the web corresponds to the direction of the web, and are substantially equal in surface speed, whereby tearing of the web is prevented when a local thickening in the web passes between the rollers and opens the electrical circuit.

4,095,064
PADDLE FOR USE IN A ROTATING-PADDLE BIN LEVEL INDICATOR

Paul P. Fleckenstein, Port Huron, Mich., assignor to Bindicator Company, Port Huron, Mich.

Filed Sep. 27, 1976, Ser. No. 727,273
Int. Cl.[2] H01H 35/00
U.S. Cl. 200—61.21 4 Claims

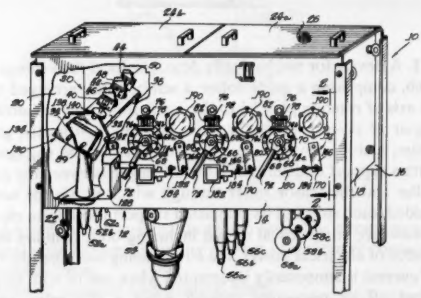


1. In a material bin level indicator of the type comprising an indicator housing having a mounting nipple extending therefrom adapted to engage a corresponding gland on a bin wall for mounting said housing, a motor carried within said housing and operatively coupled to a driveshaft having an axis of rotation extending through said nipple, and a paddle operatively coupled to and extending from said shaft to a free end of said paddle; the improvement wherein said paddle comprises a curved hollow cylindrical tube having a tubular portion adjacent said shaft and a flattened portion comprising opposed tube walls flattened in a plane coplanar with said axis and flaring into said tubular portion, and means disposed within said tubular portion for coupling said paddle to said shaft, both said tubular and said flattened portions being curved at fixed radius from adjacent said coupling means over an arc of substantially ninety degrees, said flattened portion extending over substantially fifty degrees of said arc and terminating at said free end, said paddle being dimensioned such that the same may be inserted into a bin through the mounting nipple while said paddle is coupled to said shaft.

4,095,065
SAFETY TRIP MECHANISM FOR MULTI-POSITION SWITCH

Donald J. Akers, Chicago, Ill., assignor to G & W Electric Specialty Company, Blue Island, Ill.

Filed Mar. 15, 1977, Ser. No. 777,936
Int. Cl.[2] H01H 19/32
U.S. Cl. 200—63 R 7 Claims

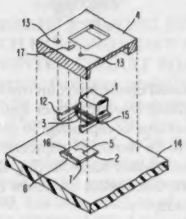


1. In switchgear which includes a casing, switch contact means disposed within said casing and including at least one pair of switch contacts at least one of which is movable relative to the other between a position spaced from said other in open electrical circuit therewith and a position contacting said other in closed electrical circuit therewith, actuating means for moving said movable switch contact between said spaced and contacting positions relative to said other of said contacts, said actuating means including a movable arming handle, energy storage means operatively associated with said arm handle and said movable switch contact and adapted to create potential energy during movement of said arming handle, said actuating means further including release means operative to release said potential energy and facilitate snap-action movement of said movable switch contact between its said spaced and contacting positions; the combination therewith comprising latch plate means operatively associated with said movable switch contact and movable therewith, said latch plate means having detent means thereon, and latch lever means pivotally supported by said casing and movable between a first position cooperating with said detent means to prevent movement of said latch plate means and associated movable switch contact, and a second position released from said detent means to facilitate movement of said latch plate means and snap-action movement of said movable switch contact between its said spaced and contacting positions relative to the other of said switch contacts.

4,095,066
HINGED FLYPLATE ACTUATOR

Richard Hunter Harris, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,658
Int. Cl.[2] H01H 5/30
U.S. Cl. 200—67 A 8 Claims



1. A push-button operated, pivoting snap-action toggle switch operating apparatus, comprising:

a two-ended switch actuating member having a pivot axis near one end thereof;

a two-ended force application member having a pivot axis near one end thereof and a push-button force application means near the other end thereof;

a framework for holding said pivot axes of said members with said members being spaced apart from one another and supported by their said pivot axes in said framework with said pivot axis ends of said members, respectively, adjacent to one another and with said pivot axes parallel to one another;

a compression spring means for resiliently resisting forces applied thereto along a line of action, said spring means being fixed between and retained in compression by said force application and actuating members, whereby said spring means resiliently urges said members apart by pivoting them on their said axes in a direction causing separation between said ends of said members which are opposite the ends in which said pivot axes are located;

said framework having means for restraining said members from being separated in said manner by said spring means beyond an amount necessary to maintain said spring means in compression; and

said compression spring means being arranged so that said line of action of compression is angled with respect to said members to pass first to one side, but to be movable to the other side of, said pivot axis of said actuating member in response to pivoting of said force application member about its said pivot axis which is occasioned by forces applied to said push-button means to pivot said force application member towards said actuating member,

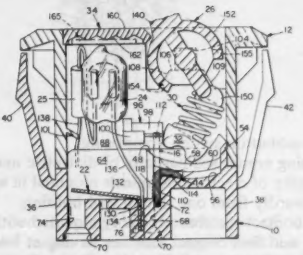
thereby causing said line of compression to move to the other side of said pivot axis of said actuating member and create a rotational moment of said member about its said axis, thereby causing said member to pivot toward said force application member in a sudden snap action.

4,095,067

APPLIANCE SWITCH

Anthony Rosario LaScola, Bellingham, Mass., assignor to Ark-Les Switch Corporation, Watertown, Mass.

Filed Mar. 16, 1977, Ser. No. 778,101
Int. Cl.[2] H01H *13/28*
U.S. Cl. 200—67 AA **4 Claims**



1. A compact snap-action appliance switch comprising

an insulating base, an insulating case adapted for assembly to said base, two fixed contacts carried in said base,

a paddle actuator movable in said case, and a roller contact movable by said actuator,

said insulating base having

a generally vertical wall element extending upwardly from said base and defining a base roller contact track portion and a further portion

said track portion having

a roller stop wall generally parallel with said wall element

side walls connecting said roller stop wall and said wall element

a track floor bounded by said walls and said wall element and having a raised roller guide extending between said wall element and said roller stop wall,

contact spacer portions on either side of said roller quide, each said spacer portion extending lengthwise generally parallel with said guide between said wall element and said roller stop wall, each said spacer portion extending widthwise from said roller guide toward the adjacent said side wall and having a narrower widthwise extension adjacent said wall element than adjacent said roller stop wall, the upper surface of a said spacer portion being intermediate in height between said track floor and said roller guide upper surface,

said track floor, said roller guide upper surface, and said contact spacer portion upper surfaces being generally concave upwardly with respect to said base,

said further portion having

wire apertures adjacent said wall element, extending entirely through said base, and wire retaining means adjacent thereto and cooperating with said fixed contacts and said case to retain a wire for electrical contact,

said insulating case having

wire stop means carried on the inner surfaces of said case and positioned for cooperation with said base wire apertures,

each said fixed contact having

a vertical base portion, a vertical connector portion integral therewith and extending above said base portion, and a generally horizontal extending portion declined slightly downwardly from said vertical portion, said fixed contact vertical base portion being fixed in a said base fixed contact receiving slot, said extending portion overlying said track floor and having its upper surface generally parallel with the upper surface of said contact spacer portion, said vertical connector portion engaging said case contact retaining means,

said paddle actuator having

a tapered paddle extending exterior of said case frame for manual actuation of said switch,

a downwardly extending generally flat projection having on its lower edge a spring positioner,

a closure element generally convex outwardly of said switch,

said actuator being pivotably fixed in said case,

said roller contact being electrically conductive and having two roller elements and a guide track follower portion connecting said roller elements, said follower portion being of smaller cross section than said roller elements, said roller being positioned in said base track for movement therealong,

said switch further including an insulating guide element having an upper neck portion and a lower roller engaging surface, and a compression spring secured between said actuator spring position and said guide neck, said guide lower surface engaging said roller element follower portion for movement of said roller element responsive to motion of said paddle, from

an open circuit condition in which said roller contact is urged by said spring against said roller stop wall and said roller elements are spaced from said fixed contacts,

an initial closed circuit condition in which each said roller element engages only a said fixed contact extending portion, and

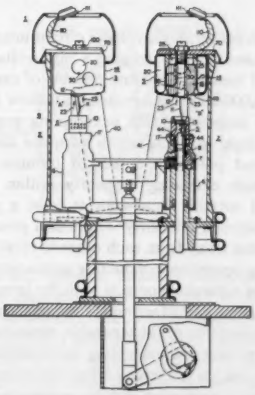
a steady-state closed circuit condition in which said roller contact is urged against said fixed contacts and said roller elements engage said vertical connector portions.

4,095,068

STATIONARY-CONTACT-AND VOLTAGE-SHIELD ASSEMBLY FOR A GAS-PUFFER-TYPE CIRCUIT-INTERRUPTER

Jeffry R. Meyer, Penn Hills Township, Allegheny County, and Robert L. Hess, North Versailles, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1976, Ser. No. 685,465
Int. Cl.[2] H01H *33/82, 9/30*
U.S. Cl. 200—144 AP **12 Claims**



1. Gas-type circuit-interrupter equipment including separable contact means to establish an arc, said separable contact means including a relatively-stationary contact and a cooperable movable contact, means defining a source of gas under pressure, means directing a flow of compressed gas from said

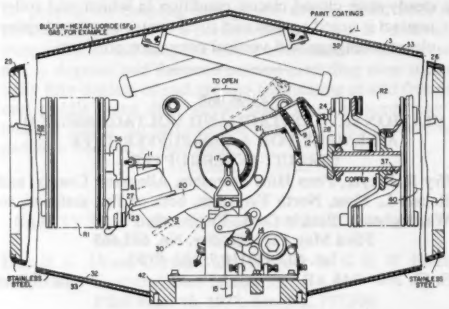
source to the established arc to effect the extinction thereof, a generally-cylindrically-shaped metallic electrostatic shield exposed to the surrounding ambient and encompassing the relatively-stationary contact and ensuring a low-gradient electrostatic field at its forward end facing the movable contact and located between the said separated contact in the fully-open-circuit position of the gas-type circuit-interrupter, and said openly-exposed metallic electrostatic shield defining an exhaust-gas collecting chamber in open pace for receiving at its forward end the hot exhaust arced gases emanating from the arcing region during the arcing period of the said gas-type circuit-interrupter.

4,095,069

STAINLESS-STEEL INTERRUPTER-HEAD CONSTRUCTION FOR CIRCUIT-INTERRUPTERS CONTINUOUSLY CARRYING HIGH-VALUE-AMPERAGE CURRENTS

Russell N. Yeckley, Murrysville, and Zeno Neri, Wilkins Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 660,745
Int. Cl.[2] H01H *33/56*
U.S. Cl. 200—148 B **6 Claims**



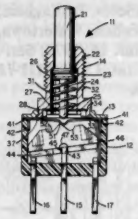
1. A high power, high-voltage circuit-interrupter including, in combination, means defining a high-voltage interruptering pressurized metallic head-unit capable of carrying currents in excess of 4,000 amperes, upstanding hollow insulating column means for supporting said interrupting pressurized metallic head-unit high up in the air an adequate distance and height from ground potential, a pair of terminal-bushings having terminal-studs extending interiorly within said interrupting pressurized metallic head-unit, at least a pair of separable contacts disposed interiorly within said pressurized head-unit and separable away from each other to establish an arc during the opening operation, conducting means electrically interconnecting said separable contacts with the terminal-studs extending through the pair of terminal-bushings, operating means for effecting separation of the separable contacts within said interrupting head-unit and subjecting the established arc to a blast of compressed gas to thereby effect the extinction thereof, said high-voltage interrupting metallic pressurized head-unit being composed substantially entirely of stainless-steel material, the pressurized metallic interrupting head-unit having an insulating outer surface coating provided thereon about its outside surface and also another insulating coating around its inside surface to assist in rapid heat transfer from the pressurized metallic head-unit to the outer external ambient atmosphere.

4,095,070

MINIATURE PUSHBUTTON SWITCH

Kenneth A. Simpson, Lynnfield, Mass., assignor to C & K Components, Inc., Watertown, Mass.

Filed Dec. 27, 1976, Ser. No. 754,848
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—153 J **16 Claims**



1. A pushbutton switch comprising:
a housing comprised partially of dielectric material;
a plurality of electrical terminals mounted in and projecting outwardly from one side of said housing;
a first contact member pivotably mounted within said housing, said first contact member having at least two operative positions and being adapted to selectively interconnect some of said terminals when in at least one of said operative positions;
a first insulative member mounted on and pivotable with said first contact member;
a leaf spring mounted within said housing and being shaped and configured to be normally in interference contact with said first insulative member;
a pivot pin extending downwardly within said housing and having an end adapted to selectively contact said first insulative member, said first insulative member being configured to receive said end of said pivot pin; and
means for longitudinally moving said pivot pin into and out of engagement with said first insulative member;
whereby upon being moved longitudinally downwardly, said pivot pin engages said first insulative member so as to cause said first insulative member and first contact member to pivot to one operative position, said first insulative member being retained in said one operative position by interference contact with said leaf spring.

4,095,071

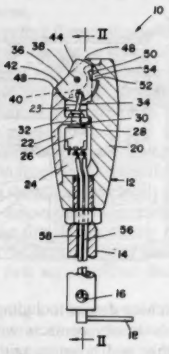
SWITCH MOUNTED IN A LEVER HANDLE

Richard W. Chamberlain, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jul. 12, 1976, Ser. No. 704,133
Int. Cl.[2] H01H *9/06*
U.S. Cl. 200—157 **2 Claims**

1. A combined lever and switch control assembly, comprising:
(a) a lever having means for defining a hollow housing at an upper end of said lever for gripping by the hand of an operator, said housing having an elongated front member extending along said lever and shaped to be gripped by the fingers of a hand, an elongated rear member extending along said lever and shaped to be gripped by the heel of a hand, and means for releasably securing said front member to said rear member, said rear member having a sloping top surface;
(b) switch means for operating a remote member, including a toggle switch mounted within said housing on said rear member and having a movable arm extending upwardly inside said housing;
(c) thumb controlled means, rotatably mounted on said rear member, for actuating said toggle switch, including means for receiving said arm to move said arm, and first and

second surfaces alternately extending above and flush with said top sloping surface for ease of actuation by the thumb of a hand, said thumb controlled means being rotatably mounted to permit a pushing action on either said first surface or said second surface to change the state of said toggle switch; and



(d) means for stopping rotary movement of said thumb controlled means when said toggle switch is in either state, including a fixed projection extending from said front member internally of said housing, and a pair of spaced-apart shoulders on said thumb controlled means straddling said projection, either of said shoulders contacting said projection depending on the direction of rotation of said thumb controlled means.

4,095,072

INDUSTRIAL SPEED CONTROL TRIGGER SWITCH WITH INTEGRAL REVERSING SWITCH

Earl T. Piber, Oconomowoc, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Aug. 2, 1976, Ser. No. 710,922

Int. Cl.[2] H01H *13/08;* **H02P** *7/00*

U.S. Cl. 200—157 **15 Claims**

1. An industrial trigger switch for mounting in the insulated handle of a portable electric tool comprising:

an insulating housing having a forward opening and wire apertures;

an insulating, spring-biased depressible trigger having a forwardly extending finger engaging portion and a slidable portion extending rearwardly through said opening into said housing;

interfitting means between said trigger and said housing limiting reciprocal movement of said trigger;

switching means in said trigger switch for selectively connecting an electric power source to the tool motor;

terminals for said power source connections and said motor connections accessible from the outside of said housing through said wire apertures to enable external conductors to be connected thereto;

a relatively large surface relatively thin heat sink contiguous to inner surfaces of three vertical outside walls of said housing;

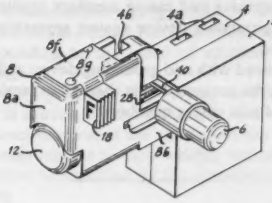
controllable thyristor means mounted on said heat sink;

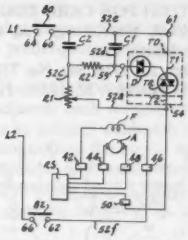
an insulating substrate mounted horizontally on the upper edge of said heat sink in said housing;

a speed control circuit mounted on said substrate and connected to said controllable thyristor means and comprising a variable resistor;

means coupling said slidable portion of said trigger to vary said variable resistor when said trigger is depressed;

said switching means comprising a double-pole on-off switch having bridging contacts including two pairs of stationary contacts mounted on said substrate and a pair of bridging contacts carried by said trigger for bridging the stationary contacts of the respective pairs thereof when said trigger is depressed, and each pole of said switch being connected to said terminals;





and no metal parts being exposed to the user when said trigger switch is mounted in the insulating handle of a portable electric tool.

4,095,073

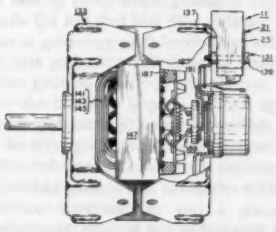
SWITCH AND TERMINAL ASSEMBLY HAVING STRIP TERMINAL AND MOUNTING MEMBER ADAPTED TO GROUND DYNAMOELECTRIC MACHINE CASING ON SIMILAR CONDUCTIVE SURFACE

James P. Frank, Rock Falls, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Mar. 30, 1976, Ser. No. 671,965

Int. Cl.[2] H01H *9/12;* **H01R** *3/02;* **H02K** *11/00;* **H05K** *5/02*

U.S. Cl. 200—293 **48 Claims**



36. A switch and terminal assembly comprising a casing having a pair of separable casing members with an opening therethrough, a switch means accommodating chamber within said casing and generally isolated from said opening, a grounding device on said casing disposed at least in part exteriorly thereof, and means associated with said grounding device and at least one of said casing members generally about said opening for retaining said casing members against separation and said grounding device against displacement from said casing.

48. A switch and terminal assembly comprising:

a casing including a pair of separable casing members;

a chamber within said casing members;

a plurality of switch means in said casing adapted for selective switching engagement;

a grounding device disposed on said casing so as to be electrically disassociated from said switch means plurality;

means for retaining said casing members against separation and said grounding device against separation from said casing; and

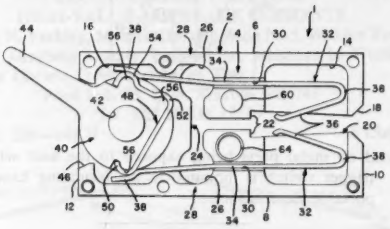
means associated with said grounding device and said retaining means for acommodating thermal expansion and contraction of said casing members.

4,095,074

SWITCH FOR CARD EDGE

Joseph LaRue Lockard, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 12, 1976, Ser. No. 731,076
Int. Cl.[2] H01H *1/22, 19/50, 21/04*
U.S. Cl. 200—295 **2 Claims**



1. A switch for mounting on a printed circuit board edge, comprising:

A housing having a first end bifurcated by a first slot with shoulders on opposite sides of said first slot for abuttingly receiving an edge of a printed circuit board,

said first slot tapering from said shoulders toward said first end to grippingly receive opposite sides of a printed circuit board inserted into said first slot and stopped against said shoulders,

a second slot extending transversely of said first slot and forming together with said first slot a T-shaped opening, each end of said second slot terminating in enlarged circular apertures adjacent corresponding side walls of said housing, said circular apertures defining resiliently yieldable hinge portions integral with said side walls allowing resilient deflection of said bifurcated housing away from said first slot in response to enlargement of said first slot by the presence therein of a printed circuit board, a rotor mounted for rotation in said housing and carrying a bridging contact, a pair of elongated conducting spring contacts mounted in said housing lengthwise of said first slot and having first end portions protruding into said slot from opposite sides thereof, said rotor being mounted between spaced apart second end portions of the said spring contacts continuously biasing said second end portions resiliently away from each other and thereby pivoting said first ends of said spring contacts toward each other independently of pivotable motion of said housing side walls,

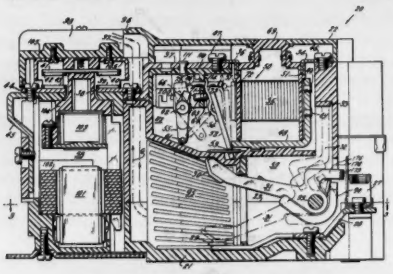
a lever on said rotor for manually rotating said rotor to a first position bridging said bridging contact electrically across said spring contacts and said rotor being rotatable to a second position disengaging said bridging contact from at least one of said spring contacts.

4,095,075

VISIBLE BLADE SWITCH

Bernard DiMarco, Bellefontaine, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 28, 1976, Ser. No. 681,253
Int. Cl.[2] H01H *9/16*
U.S. Cl. 200—308 **8 Claims**



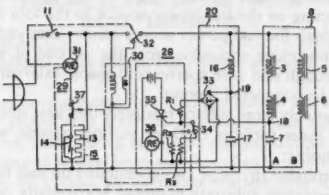
1. An electrical switching device including a housing, cooperating movable and stationary contacts within said housing, an elongated arm within said housing; said movable contact being mounted at one end of said arm; a pivot means near the other end of said arm mounting the latter for movement between a first and a second position wherein said contacts are opened and closed, respectively; said arm at a position remote from said one end including an indicating portion operatively positioned for direct viewing from positions in front of said housing, and without opening any portion of said housing, when said arm is in one of its said positions whereat said indicating portion projects through a side opening in said housing; with said arm in the other of its said positions said indicating portion being retracted from viewing from positions in front of said housing.

4,095,076

PROTECTIVE DEVICE FOR INDUCTION HEATING APPARATUS

Akihiro Tsumori, Shizuoka, and Kenji Shima, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 582,154, May 30, 1975, Pat. No. 4,015,084.
This application Aug. 30, 1976, Ser. No. 718,838
Claims priority, application Japan, Jul. 15, 1974, 49-83619
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.[2] H05B *5/04*
U.S. Cl. 219—10.49 R **2 Claims**



1. A protective device for induction heating apparatus comprising:

a specific heating element for holding a substance to be cooked,

an excitor for induction heating the specific heating element,

means for applying an operating voltage to the excitor,

a power switch for turning on the excitor,

means for delaying the application of the operating voltage

to the excitor for a predetermined time after the turning on of the power switch,

means for detecting immediately after the turning on of the power switch and thereafter the presence of a heating element other than the specific heating element, the absence of the specific heating element or any other heating element or an undesirably high temperature of the specific heating element,

means for preventing the application of operating voltage to the excitor in response to detection of the presence of a heating element other than the specific heating element, the absence of the specific heating element or any other heating element or an undesirably high temperature of the specific heating element,

the excitor comprising a first series circuit of a group of excitation windings and a capacitor, the detecting device comprising a second series circuit of a mimic winding and a capacitor, the second series circuit being connected in parallel to the first series circuit to pass current having substantially the same phase as that of the current passing through the first series circuit during normal operation, and

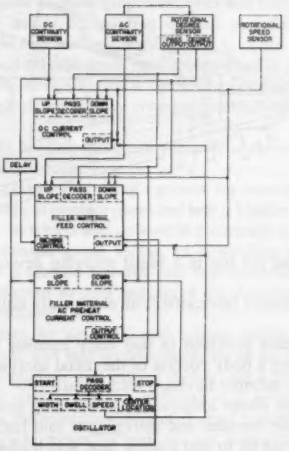
means for applying a voltage lower than the operating voltage to the excitor during the predetermined time for detecting the presence of a heating element other than the specific heating element, the absence of the specific heating element or any other heating element or an undesirably high temperature of the specific heating element.

4,095,077

AUTOMATIC HOT FILLER WIRE WELDING METHOD AND APPARATUS

Urban A. Schneider, and Robert D. Sigman, both of Pensacola, Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 25, 1976, Ser. No. 699,769
Int. Cl.² B23K 9/12
U.S. Cl. 219—61 **4 Claims**



1. A method of welding tubular members of generally circular cross section along a circumferential weld seam characterized in that substantially identical welds are simultaneously produced at a plurality of spaced stationary welding stations positioned around the weld seam in radial symmetry of the tubular member wherein the welding process comprises:

supporting the tubular members in a vertical orientation;

rotating the tubular members continuously in one direction about their axes of revolution;

monitoring the speed of rotation and the number of revolutions of the weld seam and its circumferential position relative to the welding stations and providing corresponding outputs indicative thereof;

feeding filler material into a weld zone along the seam adjacent each of the welding stations at a given deposition rate which is automatically, programmably varied proportionally with and as a direct function of the monitored output corresponding to the speed of rotation of the tubular member;

automatically, programmably varying the filler material feed speed, in a preestablished manner, at each welding station, as a direct function of the circumferential position of the weld seam relative to each welding station and the cycle of rotation as identified by the corresponding monitored outputs;

preheating of the filler material at each of the welding stations to a temperature approaching its melting temperature prior to deposit within the weld zone;

automatically controlling the power employed to preheat filler material at its operating level at each of the welding stations as a predesignated function of the filler material feed speed;

simultaneously heating the deposited filler material and the weld zone adjacent each welding station at a rate sufficient to form an integral weldment; and

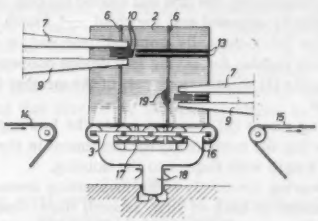
automatically controlling the power employed to heat the weld zone adjacent each weld station to vary incrementally at predetermined spaced speed of rotation intervals and remain constant between the predetermined speed levels.

4,095,078

PACKING WIRE CUTTING DEVICE

Lars Waenerlund, Munkedal, and Torsten Bobäck, Sodertalje, both of Sweden, assignors to Munkedals Aktiebolag, Munkedal, Sweden

Filed Jan. 6, 1976, Ser. No. 646,654
Int. Cl.² B23K 11/22
U.S. Cl. 219—68 **2 Claims**



1. A packing wire cutting device for cutting packing wire wrapped in the form of a parallelogram around a paper pulp bale in the form of a parallelepiped, the packing wire cutting device functioning to cut the packing wire on one side of the paper pulp bale, comprising

an electrode comprising two electrode halves separated by a gap,

means for causing relative movement between the electrode halves and said one side of the paper pulp bale,

the packing wire on said one side of the paper pulp bale being disposed transverse to the direction of relative movement of the electrode halves and said one side of the paper pulp bale so that the packing wire on said one side of the paper pulp bale will intersect the electrode halves irrespective of the exact position of the electrode halves during relative movement between the electrode halves and said one side of the paper pulp bale,

means for forcing the two electrode halves into said one side of the paper pulp bale to cause the electrode halves to be bridged by the packing wire during relative movement

between the electrode halves and said one side of the paper pulp bale, and

means for applying electrical power to the two electrode halves to melt and thereby sever the packing wire passing therebetween during relative movement of the electrode halves and said one side of the paper pulp bale.

4,095,079

TOOL HOLDER FOR A SPARK EROSION MACHINE TOOL

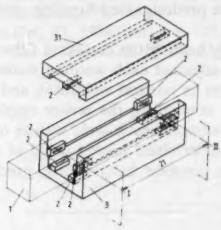
Werner Ullmann, Locarno; Paul Fricker, Losone, and Maurice Guenin, La Chaux-de-Fonds, all of Switzerland, assignors to A.G. für industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Dec. 13, 1976, Ser. No. 749,872

Claims priority, application Germany, Aug. 6, 1976, 2635520

Int. Cl.² B23P *1/08*

U.S. Cl. 219—69 E **10 Claims**



1. An assembly for use in a machine tool, for example a spark erosion machine tool, the assembly being for holding a device, for example, a tool element for the machine tool, the assembly comprising:

an elongate member (1) comprising portions defining first, second, third and fourth external bearing surfaces of the member, which bearing surfaces extend along the length of the member, the first and second bearing surfaces being mutually opposed and the third and fourth bearing surfaces being mutually opposed, one end of the member being suitable for having said device connected thereto,

a housing (3) within which part of the member (1) is housed, and

bearing means (2) mounted inside the housing (3) for supporting the member (1) for movement in the direction of its length with respect to the housing,

the bearing means (2) being in abutting contact with said member at each of first, second, third, fourth and fifth positions in each of two planes (I and II), which planes are spaced apart in, and are transverse to, the direction of the length of the member, the first and second positions being spaced apart on the first bearing surface, the third position being on the second bearing surface and the fourth and fifth positions being on respective ones of the third and fourth bearing surfaces.

4,095,080

METHOD FOR MEASURING THE EXTENT OF SHIELDING FUNCTION OF AN ARC ATMOSPHERE AND AN ARC WELDING MACHINE INCLUDING A NITROGEN OXIDE MEASURING DEVICE MEASURING THE EXTENT OF SHIELDING FUNCTION

Fumio Ueyama, Nara, and Takao Yoshimitsu, Kobe, both of Japan, assignors to Osaka Denki Co., Ltd., Osaka, Japan

Filed Jan. 7, 1976, Ser. No. 647,180

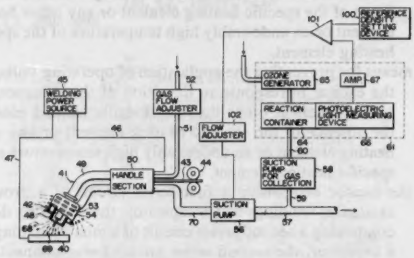
Int. Cl.² B23K *9/16*

U.S. Cl. 219—74 **10 Claims**

1. An arc welding method comprising the steps of:

supplying a predetermined amount of shielding gas around a tip portion of a welding electrode to shield the welding arc from atmospheric gas;

supplying arc welding power between said welding electrode and a mother metal to generate an arc therebetween;



measuring the concentration of nitrogen oxide in an arc atmosphere which is created in an outer atmosphere around said arc; and

controlling during welding said amount of said supplied shielding gas in response to the measured concentration of nitrogen oxide.

4,095,081

ELECTRIC ARC METAL SPRAYING DEVICES

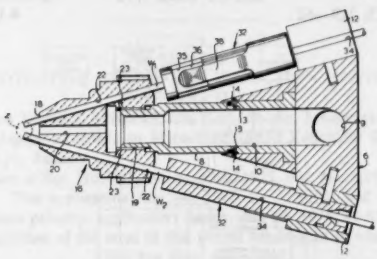
Stewart John Ashman, Dudley, England, assignor to Metallisation Limited, Dudley, England

Filed Apr. 6, 1976, Ser. No. 674,134

Claims priority, application United Kingdom, Apr. 9, 1975, 14509/75

Int. Cl.² B23K *9/04*; B05B *1/24*

U.S. Cl. 219—76.16 **15 Claims**



15. A head for use in a metal spraying device, said head comprising:

a body member fabricated from electrically insulating material;

recess means provided in said body member for securely receiving a body portion of the metal spraying device;

said body member having a leading face;

air passage means longitudinally extending axially through said body member and emerging at said leading face for conveying air to said leading face, said leading face being at a right angle to said air passage means;

inlet means provided in said body member for connecting said air passage means to a source of air under pressure;

aperture means provided longitudinally through said body member for permitting metallising wire in electrical contact to be fed therethrough in engagement with sidewalls of said aperture means, said sidewalls consisting of said insulating material of said body member;

said aperture means consisting of two guide passages, said two guide passages converging continuously towards each other in a direction towards said leading face and extending from a rear surface of said body member to said

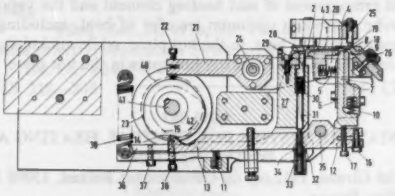
leading face, and said two guide passages emerging at said leading face on opposite sides of said air passage means to provide an arcing zone for two metallising wires as the two wires emerge from said two guide passages respectiveiy.

4,095,082

APPARATUS FOR WELDING ELECTRICAL CONTACTS

Hans Rudolf Zollinger, Geroldswil, Switzerland, assignor to H. A. Schlatter AG, Schlieren, Switzerland

Filed Jun. 14, 1976, Ser. No. 695,816
Claims priority, application Switzerland, Jun. 27, 1975, 8363/75
Int. Cl.[2] B23K *11/00*
U.S. Cl. 219—78.15 7 Claims



1. An apparatus for the production of electrical contacts on contact carriers, comprising:

a cutting device adapted to cut a contact piece from a strip of wire or ribbon-like contact material;

a first guide means positioned for guiding the strip of contact material to said cutting device;

an electrical resistance welding device spaced from said cutting device for welding a cut contact piece to a contact carrier;

a second guide means arranged between said cutting and said welding device for guiding contact material from said cutting to said welding device;

said first and second guide means connected in alignment;

said welding device having a first stationary electrode and a second electrode liftably arranged beneath said first electrode;

a holder for holding the contact carrier at the underside of said first electrode;

said second electrode having a groove for receiving a lower part of the cut contact piece and being liftable from a rest position, in which said groove is connected in alignment to said second guide means, to a welding position, in which it is pressed towards said first electrode, gripping means adapted to grip and move the remaining strip of contact material; and

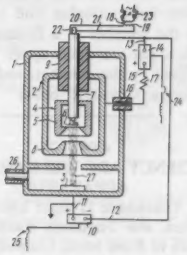
driving means for actuating said cutting device, said gripping means and said second electrode in such a manner that, in sequence, said cutting device cuts a contact piece from the strip of contact material, said gripping means advances the remaining strip of contact material into said second guide means to push the cut contact piece from said cutting device through and out of said second guide means in said groove of said second electrode, being in its rest position, and subsequently withdraws the remaining strip of contact material from said second guide means by a distance which is smaller by the length of the cut contact piece than the distance by which the cut contact piece is advanced to said groove of said second electrode by the strip of contact material, and upon the beginning of said withdrawing of the remaining strip of contact material said second electrode is lifted from said rest position to said welding position and thereafter descented to said rest position.

4,095,083

ELECTRON-BEAM APPARATUS FOR THERMAL TREATMENT BY ELECTRON BOMBARDMENT

Boris Grigorievich Sokolov, Nosovikhinskoe Shosse, 11, kv. 64, Zheleznodorozhny, and Georgy Fomich Zaboronok, pereulok Obukha, 4, kv. 56, Moscow, both of U.S.S.R.

Filed Jul. 24, 1974, Ser. No. 491,556
Int. Cl.[2] B23K *15/00*
U.S. Cl. 219—121 EB 3 Claims



1. An electron-beam apparatus for thermal treatment by electron bombardment, comprising:

a vacuum chamber accomodating an object being treated;

an electron gun housed in said vacuum chamber and including a cathode which is the source of an electron flow and an accelerating electrode forming, together with said cathode, said electron gun, said cathode and said accelerating electrode forming said electron flow into an electron beam directed to said object being treated, and being electrically insulated from each other and from said object being treated;

a power supply which is a source of d-c voltage, the negative terminal of which is connected to said cathode and the positive terminal is connected to said object being treated; and

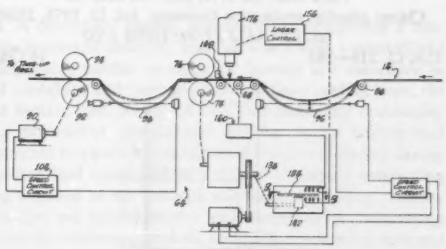
a supplementary source of accelerating voltage, which is a d-c voltage source, the negative terminal of which is connected to said cathode and the positive terminal is connected to said accelerating electrode, the potential difference created by said accelerating voltage source between said cathode and said accelerating electrode exceeding that created by said power supply by no less than 50 V.

4,095,084

METHOD AND APPARATUS FOR PERFORATING ELONGATE MEMBERS

George V. Shutt, 918 Willow Springs La., Glendora, Calif. 91740

Filed Apr. 14, 1977, Ser. No. 787,553
Int. Cl.[2] B23K *9/00*; B26D *5/00*
U.S. Cl. 219—121 LM 28 Claims



1. The method of perforating an elongate member comprising the steps of:

(a) intermittently and relatively feeding said member endwise through a perforating station in a manner such that said member is periodically arrested with a portion of the member located at said station,

(b) pulsing a laser in timed relation to the intermittent motion of said member though said station to produce a laser beam pulse of sufficient duration and intensity to penetrate the member when the member is arrested and directing each pulse against the portion of the member currently located at said station to form a hole in the member, and

(c) said member being tubular, and including the step of maintaining the member in a flattened condition at said station with a gap between upper and lower flattened sections defined by the member, and with the upper section facing toward the laser beam.

4,095,085

HIGH EFFICIENCY ARC WELDING PROCESS AND APPARATUS

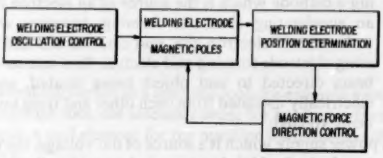
Makoto Tomita, Yokohama; Hisaaki Yokota, Chigasaki; Syozi Koga, Kamakura, and Toshisada Kashimura, Tokyo, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Sep. 29, 1976, Ser. No. 727,705

Claims priority, application Japan, Sep. 29, 1975, 50-118078; Sep. 29, 1975, 50-118076

Int. Cl.[2] B23K *9/08*

U.S. Cl. 219—123 **18 Claims**



1. An arc welding process comprising the steps of:

preparing a welding groove between plates forming a welding line;

generating a welding arc between a welding electrode and the plates to be welded;

oscillating the welding electrode;

generating a magnetic force;

oscillating the direction of the welding arc by the magnetic force in synchronism with the oscillating of the welding electrode;

whereby the welding arc is directed to the groove face of each plate to be welded.

4,095,086

VAPORIZING AND WARMING DEVICE FOR BEVERAGE-PREPARING MACHINES

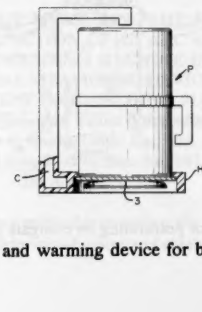
Helmut Ohnmacht, and Ernst Brechner, both of Kandel, Germany, assignors to Firma Fritz Eichenauer, Germany

Filed Mar. 19, 1976, Ser. No. 668,402

Claims priority, application Germany, Jul. 11, 1975, 2530967

Int. Cl.[2] A47J *31/44;* H05B *3/00*

U.S. Cl. 219—283 **14 Claims**



1. Vaporizing and warming device for beverage-preparing machines, especially for household coffee machines and the like; said device comprising:

a hot plate for keeping the thus-prepared beverage warm, said hot plate having at least two sides,

a vaporizer tube carrying water for preparing the beverage, and said vaporizer tube being thermally connected to one side of said hot plate,

a heating element yielding the heat required for respective vaporization and warming processes, said heating element being thermally conductively connected with the vaporizer tube and being arranged together with the vaporizer tube at one side of the hot plate, said heating element being arranged laterally offset with respect to the vaporizer tube and with its portion closest to the hot plate being spaced from said hot plate at a perpendicular distance which is smaller than the height of the vaporizer tube perpendicularly to the hot plate,

said arrangement of said heating element and the vaporizer tube providing optimum transfer of heat, including primarily radiant heat, to the hot plate, while minimizing the development of localized hot spots in the hot plate.

4,095,087

MINIATURE SYSTEM FOR CENTRAL HEATING AND WATER HEATING

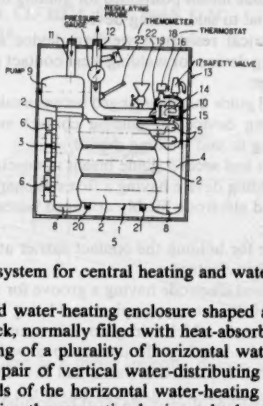
Gabriel Giraud, 191, rue du Commandant Roland, 13008 Marseilles, France

Filed Dec. 1, 1975, Ser. No. 636,361

Claims priority, application France, Dec. 2, 1974, 74 40708

Int. Cl.[2] H05B *1/00;* F24H *3/06;* F24D *3/02;* F24H *1/10*

U.S. Cl. 219—298 **6 Claims**



1. A compact system for central heating and water heating, comprising;

a heat-insulated water-heating enclosure shaped as a single metallic block, normally filled with heat-absorbing water and consisting of a plurality of horizontal water-heating tubes and a pair of vertical water-distributing tubes disposed at ends of the horizontal water-heating tubes and interconnecting the respective horizontal tubes in parallel flow relation, so that the shape and the size of the block correspond to the shape and size defined by the horizontal and vertical tubes and so that the water between the vertical tubes fills substantially the entire space defined by the horizontal tubes;

electric immersion heating resistors mounted to extend substantially entirely through each horizontal tube and through adjacent parts of each vertical tube and distributed over the water flow space defined thereby, for electric resistive heating of the water;

a water-circulating pump mounted directly on an upper end of one of the vertical tubes for pumping water through the horizontal tubes to be heated therein by the resistors and to be circulated for central heating and water heating, the pump having an inlet means for receiving water to be heated and outlet means communicating with the upper end of said one vertical tube through which the water to be heated is pumped into the vertical tube for distribution to the horizontal tubes; and

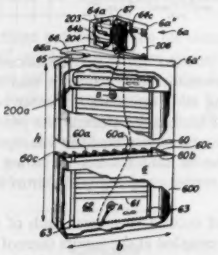
a water-mixing device mounted directly on an upper end of the other vertical tube and housed within a vertical extension thereof for mixing portions of the water pumped through the several horizontal tubes before its being circulated for central heating and water heating, said device having an inlet communicating with the upper end of the other vertical tube for receiving the heated water therefrom, an outlet for supplying the heated water to the point of use, and means intermediate the inlet and outlet for causing mixing of the heated water.

4,095,088

ELECTRICAL ENERGY SUPPLIED HEAT-EMITTING RADIATOR

Verner Andersson, Stationsgatan 1B, 824 00 Hudiksvall, and Hans Jonason, Rubinvagen 29, 852 40 Sundsvall, both of Sweden

Filed Mar. 31, 1976, Ser. No. 672,271
Claims priority, application Sweden, Apr. 2, 1975, 7503759
Int. Cl.[2] F24H *9/08*; F24D *13/02*; H05B *3/02*
U.S. Cl. 219—345 **12 Claims**



1. A heat-emitting radiator supplied with electrical energy and adapted for mounting on a building interior structure, such as a wall, comprising:

a contact rail adapted for mounting on a structure and including current conducting means;

a guide rail also adapted for mounting on said structure in spaced-apart relationship from said contact rail;

a connecting cassette supported by said contact rail and said guide rail and having contact means for feeding current to said contact rail current-conducting means, and having means for connecting said contact means to a source of electrical power; and,

at least one heating cassette supported by said guide rail and said contact rail and including heat-emitting resistance means fed by current applied to said contact rail and having means for contacting said current-conducting means in said contact rail for feeding current to said resistance means.

4,095,089

SEQUENCING SWITCH ASSEMBLY

Albert F. Ditzig, Hoffman Estates, Ill., assignor to Molex Incorporated, Lisle, Ill.

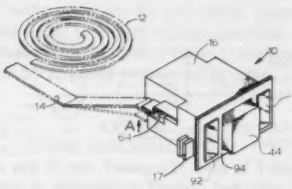
Filed Oct. 18, 1976, Ser. No. 733,145
Int. Cl.[2] F27D *11/00*
U.S. Cl. 219—441 **11 Claims**

1. A switch assembly for use in association with a heating element which heats a medium comprising:

a housing;

a first switch mounted in the housing and movable between on and off positions and electrically connected to the heating element to turn the element on and off, said first switch including resilient means tending to keep said second switch in a normally off position and a movable lock member associated between said first switch and thermally responsive actuating means to maintain said resilient means;

a second switch mounted in the housing movable between on and off positions and mechanically associated with the first switch so that said second switch is movable from its off position to its on position when said first switch is moved from its off position to its on position;



manually operable actuating means mounted on the housing and associated with said first switch for moving said first switch from it off position to its on position; and

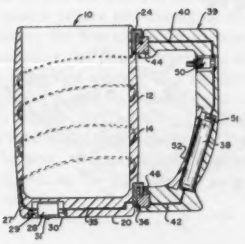
thermally responsive actuating means associated between said first switch and the medium for moving said first switch from its on position to its off position when the medium reaches a given temperature.

4,095,090

ELECTRICALLY-HEATED CONTAINER

Anthony Pianezza, 3445 Donna St., Springfield, Ill. 62707

Filed Dec. 27, 1976, Ser. No. 754,907
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—441 **9 Claims**

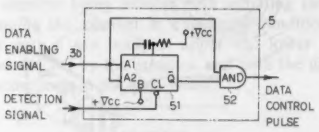


1. A device for heating liquid material comprising a container formed of dielectric material with a base, a sidewall and a detachable handle, an electrical heating unit embedded in said container, said heating unit having two heating leads, the first heating lead connected to a first electricity conducting tang mounted on the sidewall and the second heating lead connected to a switch mounted on the base, said switch having a switch lead connected to a second electricity conducting tang mounted on the sidewall, said handle including a battery with first and second battery leads connected to cooperating electricity conducting sockets, said tangs cooperating with said sockets and providing means for structural and electrical connection of the detachable handle to the sidewall, said switch responsive to changes in the position of the container when the container is picked up by the user.

4,095,091
METHOD FOR CONTROLLING INFORMATION RECOGNIZING OPERATION

Yoshiaki Nakano, Gifu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 11, 1977, Ser. No. 786,625
Claims priority, application Japan, Apr. 21, 1976, 51-45995
Int. Cl.[2] G06K 7/10
U.S. Cl. 235—462 3 Claims



1. A method for controlling information recognizing operation comprising the steps of:

transferring an object on a predetermined route at a constant speed, said object being recorded with information on the surface thereof;

generating a detection signal while said object passes through a predetermined position on said route;

scanning said information recorded on said object to thereby generate a data enabling signal per each object after the start of said detected signal;

generating a timer signal having a constant time period preset to be not longer than a period in which said object completes passing through said predetermined position, said timer signal being triggered by either one of said detection signal or said data enabling signal whereby said timer signal is generated per each object; and

controlling information recognizing operation in response to said timer signal so that said information recorded on said object is recognized with said constant time period.

4,095,092
AQUATIC ANIMAL COUNTING

Gregor N. Neff, 85 Myrtle Ave., Dobbs Ferry, N.Y. 10522

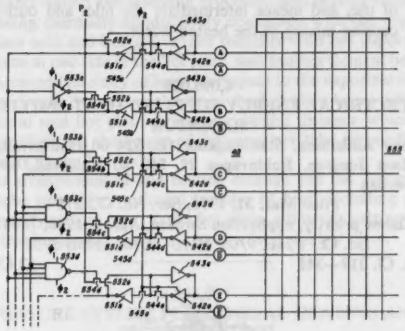
Filed Sep. 13, 1976, Ser. No. 722,417
Int. Cl.[2] G06M 11/00; A01K 61/00
U.S. Cl. 235—92 PK 21 Claims

1. A device for aquatic animal measurement, said device comprising, in combination, sorting means for sorting said animals as to size, said sorting means including barrier means for restraining the movement of said animals, said barrier means having a plurality of openings of a size predetermined to pass animals smaller than a selected size and restrain other of said animals, detecting means adjacent each of said openings to detect the passage of one of said animals through it, said detecting means including signaling means for each opening for developing an electrical signal upon the passage of an animal through said opening, storage means for storing each such signal, sampling means for sequentially sampling the signals stored in said storage means, and counting means for counting the number of animals detected by said detecting means, said counting means being adapted to count the signals taken from the storage means by said sampling means.

4,095,093
SYNCHRONOUS STATE COUNTER

Larry L. Miles, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 27, 1976, Ser. No. 735,918
Int. Cl.[2] H03K 23/24
U.S. Cl. 235—92 GT 1 Claim



1. A state time counter for a microprocessor system, said counter being responsive to a clock in said microprocessor system for counting state times, said counter comprising:

(a) a plurality of latches for storing bits providing a binary representation of the state time the microprocessor system is in, each one of said latches including a pair of first inverters and means coupling said pair of first inverters in series;

(b) a plurality of second inverters, each of said second inverters being coupled at the inputs thereof to an output of one of the inverters in said pair of first inverters, said second inverters outputting a carry control signal;

(c) a plurality of transistors, each one of said transistors coupling the output of one of said plurality of second inverters to the input of the other inverter in one of said pairs of first inverters;

(d) means coupling said clock to the control element of the one of said plurality of transistors coupled to the other inverter in said pair of first inverters forming the latch storing the least significant bit of the state time in said microprocessor system for changing the state of the latch storing the least significant bit in response to said clock;

(e) means coupling said clock and selected ones of said carry control signals to each of said plurality of transistors coupled to the other inverter in said pairs of first inverters forming the latches storing bits more significant than said least significant bit for changing the state of the latches storing bits more significant than the least significant bit in response to the carry control signal outputted from all second inverters associated with latches storing bits less significant than the latch to be switched being of a preselected state and further in response to said clock.

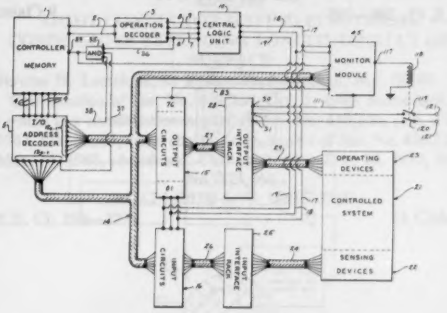
4,095,094
MALFUNCTION DETECTION SYSTEM FOR A PROGRAMMABLE CONTROLLER

Odo J. Struger, Chagrin Falls; William W. Searcy, Richmond Heights, and Ernest F. John, Willoughby, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation of Ser. No. 434,333, Jan. 17, 1974, abandoned. This application Mar. 21, 1977, Ser. No. 779,916
Int. Cl.[2] G06F 1/00; G05B 11/00
U.S. Cl. 235—304.1 4 Claims

1. In a programmable controller having a memory which stores a control program that is continuously and repeatedly executed to direct a logic unit to operate operating devices on a controlled system in response to the logic states of sensing

devices on the controlled system, the improvement therein comprising a diagnostic module for periodically checking the operation of said programmable controller while it is on line, said diagnostic module including means for periodically operating said logic unit in a prescribed pattern, said means including a first set of instructions stored in said memory with the control program which directs the logic unit to operate an



output in a prescribed pattern, means for detecting deviations in the operation of said logic unit from said prescribed pattern including a second set of instructions stored in said memory which direct the logic unit to examine the logic state of said output, and a diagnostic register for indicating a malfunction when a deviation is detected, wherein the execution of said first and second set of instructions are interleaved with the execution of the control program instructions.

4,095,095

APPARATUS FOR MANUFACTURING SEMICONDUCTOR DEVICES

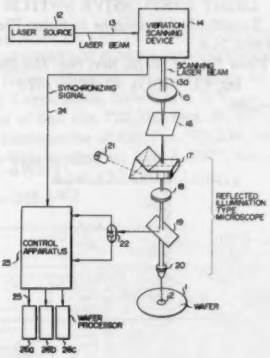
Hisashi Muraoka, Yokohama, and Teruo Yoneyama, Yokosuka, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 782,757

Claims priority, application Japan, Mar. 31, 1976, 51-34414; Mar. 31, 1976, 51-35661; Mar. 31, 1976, 51-35662

Int. Cl.[2] G06C *15/00*; G06K *7/10, 19/06*; B01J *17/00*

U.S. Cl. 235—419 **7 Claims**



1. An apparatus for manufacturing semiconductor devices, comprising:

a scanning device for scanning a binary-coded pattern formed on a selected region of a semiconductor wafer, having high and low reflection portions and containing an item of wafer processing information based on which a semiconductor device is to be manufactured in the semiconductor wafer, thereby to obtain an item of scanned information;

a control apparatus for storing a plurality of items of wafer processing information and reading out, in response to an item of scanned information from said scanning device, an item of wafer processing information which corresponds to the item of scanned information, thereby to produce a control signal corresponding to the item of wafer processing information thus read out; and

at least one wafer processor for processing, upon receipt of the control signal from said control apparatus, the wafer in accordance with the item of wafer processing information which corresponds to the control signal.

4,095,096

CODE DISCRIMINATOR

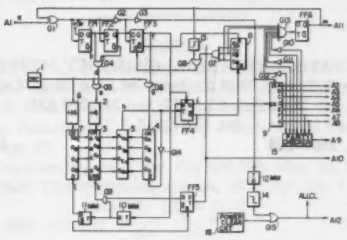
Shuzi Harada, and Tetsuo Yamaguchi, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 23, 1976, Ser. No. 716,711

Claims priority, application Japan, Sep. 2, 1975, 50-106740

Int. Cl.[2] G06K *7/14, 19/06*

U.S. Cl. 235—463 **5 Claims**



1. A code discriminator for discriminating code consisting of modules of bars and spaces and including guard patterns, characters and a center bar pattern, comprising:

means for scanning the code and transforming the code into an electric signal;

first discriminator means for counting the width of the basic module of the bar and the width of the basic module of the space in the guard pattern and averaging the widths, and for discriminating the first character following the guard pattern by sampling the first character in start-stop synchronization using said average as a standard width; and

second discriminator means for counting the total width of the character before the character to be discriminated, dividing said total width by the number of modules constituting one character to provide another standard width, and for discriminating the character by sampling in start-stop synchronization.

4,095,097

PULSED LIGHT SIGNAL RECEIVER

Gerome R. Reeve, Longmont, Colo., assignor to Gerald F. Titus, Denver, Colo.

Filed Dec. 22, 1976, Ser. No. 753,414

Int. Cl.[2] H04B *9/00*

U.S. Cl. 250—199 **6 Claims**

1. A receiver for pulsed light signals comprising:

a pulsed light detecting means including a phototransistor having base and collector and emitter electrodes,

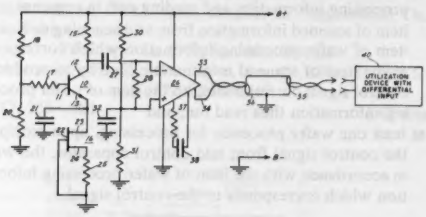
means for biasing the base of said transistor to a constant voltage,

a load resistance in the collector circuit of said transistor,

a signal output connected to said load resistance,

a constant current device in the emitter circuit of said transistor, and

a capacitor for bypassing current within a predetermined range of frequencies around said constant current device



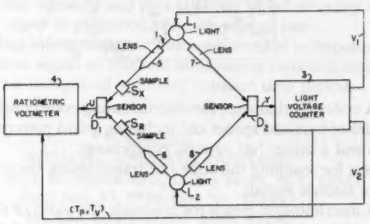
whereby the gain of said phototransistor is high for signals in said range of frequencies.

4,095,098

RATIOMETRIC TRANSPARENCY METER

Norman G. Looper, 7969 Engineer Rd., San Diego, Calif. 92111

Filed Feb. 17, 1977, Ser. No. 769,635
Int. Cl.² G01J *1/32*
U.S. Cl. 250—205 **10 Claims**



1. In the control and measurement of a physical parameter P_X in response to a voltage controlled energy source, an apparatus for ratiometrically measuring P_X in a particular setting S_X by comparison to the value P_R obtained for such parameter in a reference setting S_R, which comprises:

two voltage controlled energy sources L_1, L_2;

a sensor D_1 exposed to the combined effect of L_1 and L_2, and having an electrical output signal proportionally responsive to the combined powers of L_1 and L_2;

a sensor D_2 exposed to the effect of L_1 through S_X and to the effect of L_2 through S_R, having an electrical output signal proportionally responsive to the combined effects of L_1 through S_X and of L_2 through S_R;

means for impressing a square-wave-shaped voltage supply V_2 to L_2;

means for impressing a continuous voltage supply V_1 to L_1;

means for regulating the voltage supply impressed upon one of said energy sources in proportion to the intensity of the effect of the other energy source upon D_2;

means for detecting the output signal amplitude U_{T_P} of D_1 during the peak period T_P of V_2 and the output signal amplitude U_{T_V} of D_1 during the valley period T_V of V_2.

whereby P_X can be determined from the equation:

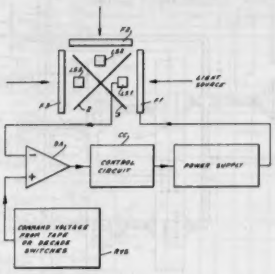
$$P_X = (P_R U_{T_V} / U_{T_P} - U_{T_V})$$

4,095,099

ADDITIVE COLOR SYSTEM WITH COMPENSATION OF REPEATABILITY ERRORS OF VARIABLE-DENSITY ELECTROOPTICAL FILTER UNITS

Franz F. Ehrenhaft, Forest Hills, N.Y., assignor to Anamorphic Ltd., Forest Hills, N.Y.

Filed Feb. 17, 1977, Ser. No. 769,838
Int. Cl.² G01J *1/32*
U.S. Cl. 250—205 **9 Claims**



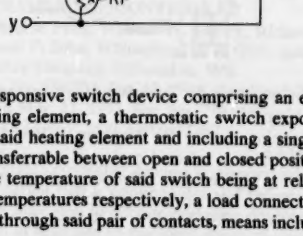
1. In an additive color system, in combination, light source means providing three component light beams; combining means operative for receiving the three component light beams and combining the same to form a composite light beam; three variable-density electrooptical filter units, each arranged in the path of a respective one of the three component light beams, each filter unit being provided with control electrodes and being operative for attenuating the respective component light beam to an extent dependent upon the control voltage applied across the control electrodes; transmission-value-establishing means operative for setting the filter units to different transmission levels, comprising selecting means operative for selecting the transmission values to be established, control-voltagegenerating means connected to the selecting means and operative for generating and applying to the control electrodes of the filter units control voltages dependent upon the selected transmission values and including compensating means operative for compensating for repeatability errors in the response of the filter units.

4,095,100

LIGHT RESPONSIVE SWITCH

David Selick, Tenafly, N.J., assignor to Selco Electronics, Inc., Palisades Park, N.J.

Filed Jul. 30, 1976, Ser. No. 710,356
Int. Cl.² H01H *47/24, 61/013*
U.S. Cl. 250—206 **6 Claims**



1. A light responsive switch device comprising an electric resistance heating element, a thermostatic switch exposed to the heat from said heating element and including a single pair of contacts transferrable between open and closed positions in response to the temperature of said switch being at relatively high and low temperatures respectively, a load connected to a current source through said pair of contacts, means including a

photoconductor connecting said heating element through said photoconductor to said source of current and regulating means and responsive to the opening and closing of said pair of contacts for respectively decreasing and increasing the current through said heater element.

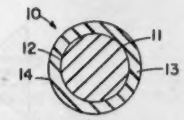
4,095,101
LIGHT CONDUCTOR HAVING ELECTRICAL CONDUCTORS EXTENDING LONGITUDINALLY OF SURFACE

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 863,768, Oct. 2, 1969, abandoned, which is a continuation-in-part of Ser. No. 649,264, Jun. 27, 1967, abandoned, and a continuation-in-part of Ser. No. 439,529, Mar. 15, 1965, abandoned. This application Dec. 10, 1973, Ser. No. 423,464

Int. Cl.[2] G02B *5/14*; H02G *3/00*

U.S. Cl. 250—227 **11 Claims**



1. A composite electrical assembly comprising in combination:

an elongated core member which is flexible throughout its length and is made of an electrically insulating material,

a plurality of non-contacting strip-like electrical conducting elements extending parallel to each other and longitudinally along the outer surface of said elongated flexible core member wherein each of said strip-like conducting elements is bonded in integral assembly with said flexible core member,

an electrical wave energy transducing means secured to said outer surface of said flexible core member,

said electrical wave energy transducing means being electrically connected and in circuit with respective of said strip-like conducting elements extending longitudinally along said outer surface of said flexible core member whereby said strip-like conducting elements may serve as conductors of electrical energy with respect to said wave energy transducing means.

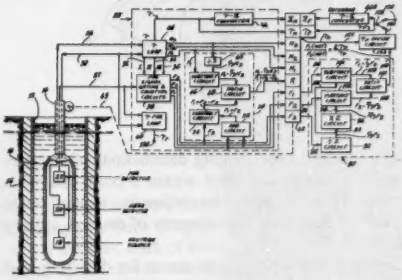
4,095,102
HYDROCARBON DETECTION UTILIZING NEUTRON BOREHOLE MEASUREMENTS

Maurice P. Tixier, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 728,330, Sep. 30, 1976, abandoned, which is a continuation of Ser. No. 579,536, May 21, 1975, abandoned. This application Apr. 8, 1977, Ser. No. 785,806

Int. Cl.[2] G01V *5/00*

U.S. Cl. 250—265 **26 Claims**



1. A machine method of automatically indicating the presence of hydrocarbons in subsurface earth formations traversed by a borehole, comprising:

(a) operating a neutron source for a predetermined time period;

(b) operating a plurality of detectors differently spaced from said source to produce neutron-dependent responses during predetermined times relative to the operation of said source;

(c) combining at least some of said responses to produce a first pore volume indication which is primarily dependent upon the hydrogen content of the fluid in the pore space of a formation adjacent said detectors;

(d) combining at least some of said responses to produce a function representative of a thermal neutron absorption characteristic of said formation; and

(e) combining the absorption characteristic function of said formation with a predetermined absorption characteristic for the water component of said formation to produce a second pore volume indication which is uncompensated for differences between the thermal neutron absorption characteristics of the matrix and any hydrocarbons present in the formation such that the presence of hydrocarbons is indicated by differences between said produced first and second pore volume indications.

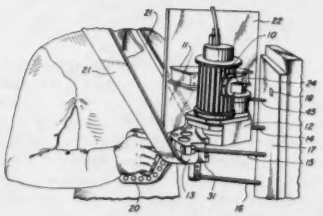
4,095,103
APPARATUS AND METHOD FOR DETERMINATION OF RESIDUAL STRESS IN CRYSTALLINE SUBSTANCES

Jerome B. Cohen, Glencoe, Ill., and Michael R. James, Groningen, Netherlands, assignors to Northwestern University, Evanston, Ill.

Continuation-in-part of Ser. No. 666,393, Mar. 12, 1976, abandoned. This application Jul. 28, 1977, Ser. No. 819,985

Int. Cl.[2] G01N *23/20*

U.S. Cl. 250—277 CH **7 Claims**



1. A quick and precise method for determination of residual stress in crystalline substances by locating a plurality of X-ray diffraction peaks with a single X-ray detector and without diffractometer shifting of said X-ray detector, said method comprising the steps of

(a) focusing an X-ray source to direct X-rays at an angle with respect to a principal surface of a crystalline substance;

(b) diffracting said X-rays;

(c) receiving X-rays emanating from the substance in a single position-sensitive X-ray detector responsive to said X-rays to produce a multiplicity of ionizing events clustered about a position corresponding to a diffraction peak, said single position-sensitive X-ray detector including a collecting element providing first and second voltage pulses at respective first and second output ends of said detector in response to ionized particles, said first and second voltage pulses each having a rise time proportional to respective distances between the position of an ionizing event occurring within said detector and said first and second output ends of the collecting element;

(d) locating a diffraction peak of said X-rays correlated with a first diffraction angle by determining rise times of the

first and second voltage pulses produced in said collector, thereby indicating a position of an ionizing event occurring within said detector corresponding to a first diffraction peak;

(e) varying a preselected angle the relationship between said X-ray source and said principal surface of the crystalline substance; and

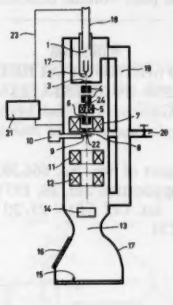
(f) locating a second diffraction correlated with a second diffraction angle by repeating steps (a) through (d), step (c) being performed with the same position-sensitive X-ray detector used for locating said first diffraction peak, a difference between the first and second diffraction angles being indicative of magnitude and direction of residual stress in the substances.

4,095,104

ELECTRON MICROSCOPE

Jan Bart LePoole, Delft, and Karel Diederick van der Mast, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 24, 1976, Ser. No. 717,193
Int. Cl.[2] H01J *37/26*
U.S. Cl. 250—311 **7 Claims**



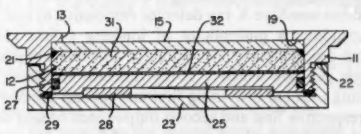
1. An electron microscope, comprising an electron gun for generating an illuminating electron beam objective lens means directing said beam to an object plane, projection lens means directing said beam from said object plane to an image plane, and a device for the apparent enlargement of the aperture of the illuminating electron beam, characterized in that the device for the apparent enlargement of the aperture comprises a beam deflection device which includes a power supply source for tilting the illumination electron beam about a point situated in said object plane.

4,095,105

STANDARDIZING TEST SAMPLE

Robert D. Rosenthal, Gaithersburg, Md., assignor to Neotec Corporation, Silver Spring, Md.

Filed Feb. 3, 1977, Ser. No. 765,308
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—338 **12 Claims**



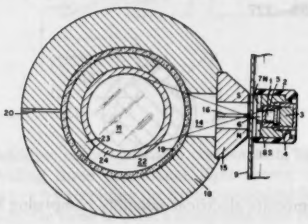
1. In a standard test sample comprising a closed container including a window transparent to irradiation of a predetermined wavelength, the improvement wherein a mixture of organic material and a second material is in said container positioned against said window, said second material being impervious to water and transparent to said predetermined wavelength, said organic material being present in an amount effective to be analyzed by irradiation, said second material being present in an amount effective to resist migration of moisture in said mixture.

4,095,106

RADIATION ATTENUATION GAUGE WITH MAGNETICALLY COUPLED SOURCE

Steven A. Wallace, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 16, 1977, Ser. No. 778,196
Int. Cl.[2] G01N *23/00*
U.S. Cl. 250—358 R **9 Claims**



1. An apparatus for measuring thickness and density of a material comprising in combination:

a source of gamma radiation contained within a housing comprising magnetic or ferromagnetic material;

means for measuring the intensity of gamma radiation, said measuring means having an aperture for admitting radiation to be measured; and

magnetic means disposed adjacent said aperture of said measuring means, said housed source being held by magnetic attraction in a position before said aperture such that gamma radiation from said source passes through said aperture and is measured by said measuring means.

4,095,107

TRANSAXIAL RADIONUCLIDE EMISSION CAMERA APPARATUS AND METHOD

Sebastian Genna, 618 Belmont St., Watertown, Mass. 02172, and Sing-Chin Pang, 860 Harrison Ave., Boston, Mass. 02118

Filed Apr. 15, 1976, Ser. No. 677,205
Int. Cl.[2] G01T *1/20*
U.S. Cl. 250—363 S **12 Claims**

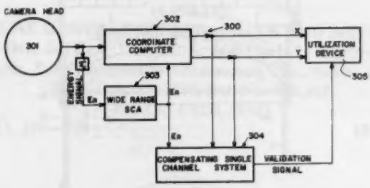
1. In an apparatus for imaging distributions of a source of penetrating radiation contained within a body and wherein said apparatus includes means for collimating emitted radiation and means for detecting the trajectory of emitted, collimated radiation:

the improvement wherein said means for detecting is arcuately shaped and said means for collimating converges to the center of an arc defined by said means for detecting.

4,095,108
SIGNAL PROCESSING EQUIPMENT FOR RADIATION IMAGING APPARATUS

Dan Inbar, Haifa, and Yitzhak Klein, Kirvat Yam, Haifa, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Sep. 14, 1976, Ser. No. 723,620
Claims priority, application Israel, Sep. 17, 1975, 48111
Int. Cl.[2] G01T *1/20, 1/164*
U.S. Cl. 250—369 **5 Claims**



1. In signal processing equipment for use with radiation imaging apparatus of the type having a scintillation crystal responsive to radiation stimuli for producing light events at spatial locations corresponding to the locations at which the stimuli interact with the crystal, and a plurality of photodetectors arranged in a predetermined array with respect to the crystal for viewing light events therein and producing output signals in response thereto, wherein the signal processing equipment includes means responsive to the output signals for generating an energy signal E_n representative of the total energy of the light event producing such signals; and coordinate computation circuitry responsive to the output signals produced by the occurrence of a light event for computing its spatial coordinates, the improvement in the signal processing equipment comprising;

means for validating the event only if E_n lies within an energy window functionally related to the coordinates of the light event.

4,095,109
RADIATION DETECTOR FOR AN AUTOMATIC X-RAY EXPOSURE TIMER

Horst Aichinger, Fuerth, and Hans Ebersberger, Nuremberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

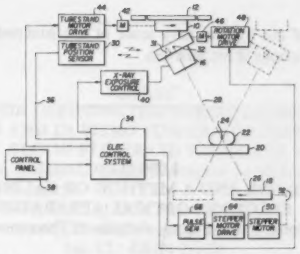
Filed Mar. 2, 1977, Ser. No. 773,500
Claims priority, application Germany, Mar. 15, 1976, 2610875
Int. Cl.[2] H05G *1/44;* H01J *39/28*
U.S. Cl. 250—374 **5 Claims**

1. A radiation detector for automatic x-ray exposure control comprising two walls of synthetic material fixed at a distance from one another, each of which being covered with a shielding layer on its exterior side and having an electrode layer on the side thereof facing the other wall, characterized in that the shielding layer is a graphite layer, and the electrode layer comprises a vacuum deposited electrically conductive material having a low atomic number.

4,095,110
MEANS FOR STEPPING X-RAY RECEPTOR IN DIRECTION OPPOSITE TO POSITION CHANGE OF SOURCE

Laverne R. Bunch, Baltimore, Md., assignor to CGR Medical Corporation, Baltimore, Md.

Filed Nov. 4, 1976, Ser. No. 739,017
Int. Cl.[2] A61B *6/02*
U.S. Cl. 250—445 T **9 Claims**



1. Apparatus for translating X-ray receptor means such as a film holder relative to the X-ray source in diagnostic X-ray apparatus a typical example of which is a linear tomography system, comprising the improvement of:

an elongated ball screw shaft positioned to provide translational movement of said X-ray receptor means in a predetermined direction when rotated;

ball screw nut means threaded on said shaft and attached to said X-ray receptor means;

an electrical stepper motor having a rotary output shaft coupled to said ball screw shaft and being responsive to drive pulses applied thereto to incrementally rotate said output shaft for each drive pulse applied; and

drive pulse circuit means coupled to said stepper motor and being operable to generate said drive pulses in response to a position change of said X-ray source, said drive pulse circuit means including electrical pulse generator means providing electrical drive pulses of predetermined polarity for operating said stepper motor to rotate said ball screw shaft in a direction which translates said X-ray receptor means in an opposite direction with respect to the direction of the position change of said X-ray source.

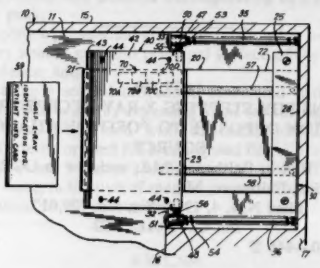
4,095,111
LIGHT DENSITY SCALE IMAGING APPARATUS AND METHOD FOR USING SAME

Seymour Katz, Glen Cove, and Victor R. Brown, West Hempstead, both of N.Y., assignors to AGFA-GEVAERT, Antwerp, Belgium

Continuation-in-part of Ser. No. 653,127, Jan. 28, 1976, Pat. No. 4,001,592. This application Jan. 3, 1977, Ser. No. 756,402
Int. Cl.[2] G03B *41/16;* G03C *5/16*
U.S. Cl. 250—476 **11 Claims**

4. A method of monitoring photographic variables, comprising the steps of loading a cassette with X-ray film; exposing the film while in said cassette to a light-density scale; exposing said film to a subject independently of its exposure to said light-density scale; developing said exposed film to form a viewable

image of said subject and to reproduce said scale; repeating the foregoing steps for successive films; and evaluating the reproductions of the light-density scale of the successive films to detect variations therebetween.



4,095,112

DEVICE FOR AND A METHOD OF CALIBRATING ELECTRON-OPTICAL APPARATUS

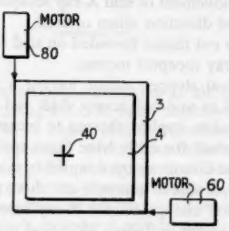
Jacques Trotel, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 543,949, Jan. 24, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 771,982

Claims priority, application France, Jan. 25, 1974, 74 02572

Int. Cl.² G01N *21/00*; G21G *5/00*

U.S. Cl. 250—492 A **4 Claims**



1. A calibrating method for an electron pattern generator, said generator having a sample holder, means for displacing said sample holder in two mutually perpendicular directions, a data processing system for sweeping said sample area by area, and each area line by line, and each line, point by point, said calibrating method comprising the following steps of:

manufacturing a marker upon said sample, at a given area bombarded by said beam at its rest position with a material capable of upon the impact of the electron beam, scattering electrons, and generating in response to this impact an electric signal;

transducing said signal into an image upon the screen of a cathode ray oscilloscope, by applying said signal upon the control electrode of said tube;

applying a programmed pattern simultaneously and synchronously to said oscilloscope and to said generator deflection system for displaying on said screen a predetermined figure centered about the image of said marker;

giving a predetermined mechanical displacement to said holder, and applying the voltage corresponding to said displacement to said deflection system of said pattern generator; and

centering again said figure about said image of said marker.

4,095,113

APPARATUS FOR PRODUCING ULTRAVIOLET RADIATION

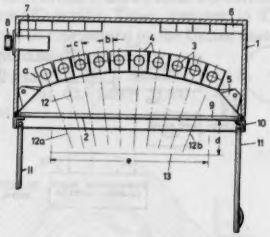
Friedrich Wolff, Bertholdstrasse 18, Frankfurt, Germany

Filed Aug. 20, 1976, Ser. No. 716,253

Claims priority, application Germany, Aug. 26, 1975, 2537855; Jan. 30, 1976, 2603460; Feb. 12, 1976, 2605487; May 31, 1976, 2624297

Int. Cl.² G01J *1/00*

U.S. Cl. 250—494 **39 Claims**



1. Apparatus for producing ultraviolet radiation, particularly a quick-tanning sunlamp, comprising at least one source of substantially uniform ultraviolet radiation including at least five closely adjacent rod-shaped low-pressure mercury lamps; reflector means associated with said source and defining at least one exit opening for ultraviolet radiation, said reflector means including a discrete trough-shaped reflector for each of said lamps and each of said reflectors surrounding the respective lamp along an arc of at least 180°, said source and said reflector means being constructed and assembled to establish a high-density radiation field of predetermined area in the region of said exit opening and the heat output of said lamps being sufficiently low to insure that the temperature in the region of said field is within a range which is below the range of discomfort to a person exposed to said field; and means for intercepting at least the major percentage of wavelength bands of ultraviolet radiation below approximately 315 nm ahead of said field so that said field consists essentially of the remaining wavelength band of ultraviolet radiation.

4,095,114

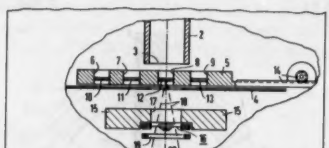
ARRANGEMENT FOR SCATTERING ELECTRONS

Leonhard Taumann, Lafayette, Calif., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 18, 1977, Ser. No. 779,166

Int. Cl.² G21F *3/02*

U.S. Cl. 250—510 **11 Claims**



1. An arrangement for scattering electrons in an electron accelerator with selectable acceleration energies, comprising:

(a) acceleration means for providing a beam of electrons;

(b) first and second scattering foils arranged at a mutual spacing from one another along a direction of the beam for producing scattering properties;

(c) the first scattering foil in the beam direction having a constant thickness;

(d) the second scattering foil having a thickness decreasing from its center towards its margin;

(e) means for adapting the scattering properties to the selected acceleration energy including a set of scattering foils, each having a scattering property corresponding to a selected acceleration energy, the scattering properties of the set of foils decreasing with decreasing acceleration energy, a corresponding one of said set of foils being placed by said means into the beam path of said first scattering foil for a second acceleration energy; and

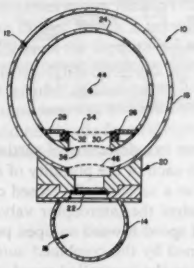
(f) said second scattering foil remaining unchanged in the beam.

4,095,115

OZONE GENERATION APPARATUS AND METHOD

F. D. Orr, Jr.; L. F. Templeton, and Larry L. Keutzer, all of Austin, Tex., assignors to Accelerators, Inc., Austin, Tex.

Filed Dec. 27, 1976, Ser. No. 754,615
Int. Cl.² C01B *13/00*
U.S. Cl. 250—538 **10 Claims**



1. Apparatus for generating ozone, comprising:

a vessel enclosing a volume maintained at an appropriate subatmospheric pressure;

a hollow cathode plasma discharge device disposed within the vessel for producing a beam of electrons;

an electron-transmissive window in the wall of the vessel positioned to receive the beam of electrons and communicating with an oxygen-containing atmosphere;

means within the vessel for speading the beam of electrons produced by the hollow cathode plasma discharge device over substantially the entire surface of the electron-transmissive window to provide an electron beam density below about 0.1mA/cm²; and

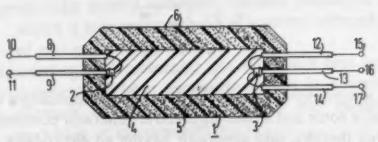
means for moving the oxygen-containing atmosphere past said window and within a suitable distance therefrom at velocities in excess of about 4000 feet per minute.

4,095,116

ELECTRO-OPTICAL COUPLING ELEMENT

Gerfried Felkel, Neubiberg; Gerhard Maier, Munich; Wolfgang Guenzel, Munich, and Guenther Waitl, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 13, 1977, Ser. No. 805,992
Claims priority, application Germany, Jun. 22, 1976, 2627944
Int. Cl.² G02B *27/00*
U.S. Cl. 250—551 **16 Claims**



1. In an electro-optical coupling device having a coupling medium mechanically and optically connecting an optical transmitter and an optical receiver and an encapsulating mass about such coupling medium, wherein the coupling medium is optically transmissive and the encapsulating mass reflects the radiation emitted from said optical transmitter and is relatively impermeable by optical radiation exterior of such coupling device for the sensitivity range of said optical receiver, the improvement comprising wherein:

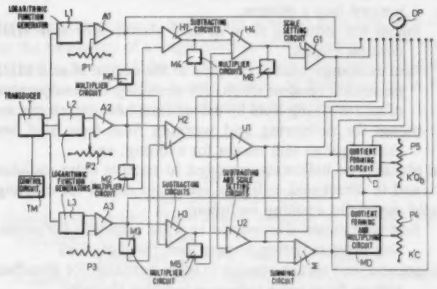
said encapsulating mass is a single substantially homogeneous layer containing therein an amount of a substantially uniformly dispersed first material particles which renders said encapsulating mass into a highly reflective medium for radiation emitted from said optical transmitter and contains an amount of substantially uniformly dispersed second material particles which render said encapsulating mass highly impermeable to optical radiation from outside said coupling device.

4,095,117

CIRCUIT FOR DEFINING THE DYE DILUTION CURVES IN VIVO AND IN VITRO FOR CALCULATING THE CARDIAC BLOOD FLOWRATE VALUE PER MINUTE

Ferenc Nagy, Budapest, Hungary, assignor to Medicor Muvek, Budapest, Hungary

Filed Jun. 30, 1974, Ser. No. 701,214
Claims priority, application Hungary, Jun. 30, 1975, ME 1872
Int. Cl.² G01N *21/28*
U.S. Cl. 250—564 **8 Claims**

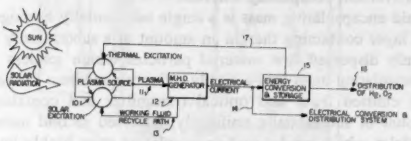


1. An apparatus for determining the concentration of a dye in a biological liquid, such as blood, comprising an optical sensing system, a counting system, a feed and control system and an indicating apparatus, said counting system having an input with three channels in accordance with the number of channels of the optical system, each of said channels of said counting system having a logarithmic circuit or the three channels together having a logarithmic circuit operating in time multiplex operation, and having three amplifiers, and four subtraction circuits connected to said channel amplifiers; three subtraction and scale setting circuits, each having an input, the outputs of said subtraction circuits being connected to the inputs of said three subtraction and scale setting circuits; a summing circuit; quotient forming circuit means; any two of the outputs of the last mentioned subtraction and scale setting circuits being connected to the input of said summing circuit, and the output of said summing circuit being connected to said indicating apparatus and to the input of said quotient forming circuit means; the outputs of said subtraction and scale setting circuits being connected to the quotient forming circuit means; the outputs of the quotient forming circuit means being connected to said indicating apparatus; and a fine adjustment potentiometer connected to further inputs of said quotient forming circuit means.

4,095,118
SOLAR-MHD ENERGY CONVERSION SYSTEM

Kenneth R. Rathbun, P.O. Box 12637, Austin, Tex. 78711

Filed Nov. 26, 1976, Ser. No. 745,198
Int. Cl.[2] H02P 9/04; H02K 45/00
U.S. Cl. 290—2 16 Claims



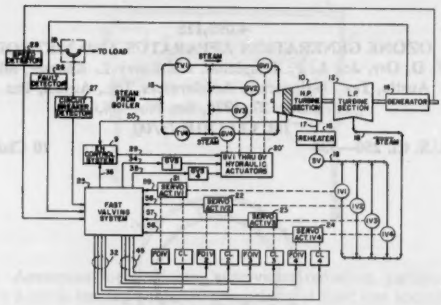
1. An energy conversion system comprising
an ionizable working fluid;
a magnetohydrodynamic generator including
conduit means for providing a path through said generator for said fluid, said conduit means having input and output ends,
means for establishing a magnetic field in said conduit means, and
means for collecting charged particles from within said conduit means and for delivering electrical energy to a load device;
means for providing a closed flow path for said working fluid from the output of said generator conduit means and to the input thereof, including
means adjacent the input end of said generator conduit means for exciting said working fluid to an elevated energy level at which said fluid is at least partially ionized into a plasma,
means for inducing flow of said plasma into said MHD conduit means,
heat exchanger means coupled to the output of said MHD generator conduit means for reducing the temperature of said working fluid by extractinng heat therefrom, and
means for delivering said working fluid from said heat exchanger to said means for exciting; and
a plurality of heliostats arranged to receive solar radiation and to direct said radiation onto said means for exciting;
said means for exciting including
first wall means transparent to solar radiation for permitting solar radiation to pass therethrough, and
second wall means opaque to solar radiation for absorbing energy from solar radiation incident thereon;
said first and second wall means being interconnected to form a conduit chamber through which said working fluid can pass, said first and second wall means being substantially perpendicular to the direction of radiation reflected from said heliostats with said first wall means between said second wall means and said heliostats;
whereby said working fluid is excited toward non-equilibrium thermal ionization by energy absorbed from said radiation by said second wall means and is at least partially photo-ionized by radiation passing through said first wall means and by radiation re-emitted by said second wall means.

4,095,119
SYSTEM FOR RESPONDING TO A PARTIAL LOSS OF LOAD OF A TURBINE POWER PLANT

Bernard Nangle; Patrick L. McGaha, both of West Chester; Thomas J. Wallace, Upper Chichester, all of Pa., and Todd B. Anderson, Hammond, Ind., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 23, 1976, Ser. No. 699,295
Int. Cl.[2] F01K 13/02
U.S. Cl. 290—40 R 10 Claims

1. A system for momentarily interrupting the total steam flow to the lower pressure turbine section of a power plant upon the occurrence of a partial loss of electrical load, comprising:
(a) a plurality of electrohydraulically adapted interceptor valves for controlling the admission of motive steam to the lower pressure turbine section, each said valve having a servo system operative to generate an electrical signal representative of its actual valve position,
(b) means to combine the generated actual position signals of each of the valves,

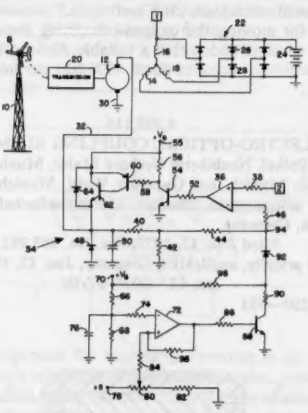


(c) means response to a detection of partial loss of electrical load to operate each of the plurality of interceptor valves from an open to a substantially closed condition,
(d) means to control the interceptor valves to operate at a predetermined speed toward an open position, and
(e) means governed by the combined actual valve position signals to change the controlled speed of opening each of the interceptor valves.

4,095,120
LOAD CONTROL FOR WIND-DRIVEN ELECTRIC GENERATORS

Kevin E. Moran, Riverton, and Eugene C. Korzeniewski, Willingboro, both of N.J., assignors to Louis Michael Glick, Cumberland, Md.

Filed Oct. 22, 1976, Ser. No. 735,003
Int. Cl.[2] H02P 9/04
U.S. Cl. 290—44 14 Claims



1. In a wind-driven electric power plant comprising a wind-responsive rotor and a rotating electric generator connected to be driven thereby, said generator having an electrically energizable field winding, apparatus for controlling the loading of said generator comprising:
means for sensing the rotational speed of said generator and

providing a signal the amplitude of which varies as a function of said rotational speed; and

control means, responsive to said signal, for controlling the current in said field winding in accordance with the rotational speed of said generator whereby the load imposed by the generator closely follows but does not substantially exceed the available power from said rotor through a wide range of rotational speeds;

wherein said sensing and signal-providing means comprises means for establishing at least four speed ranges, said speed ranges together constituting said wide range of rotational speeds, and means for establishing for each of said speed ranges a predetermined amplitude for said signal, said amplitudes being different for adjacent ranges;

wherein said control means comprises amplification means connected to receive said signal as an input, and having its output connected to deliver said current to said field winding; and

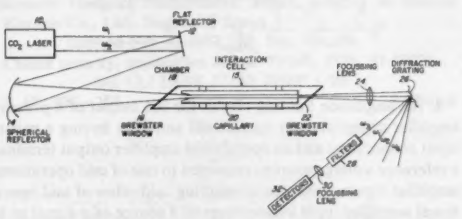
in which said means for sensing the rotational speed of said generator comprises means for providing a series of pulses the repetition rate of which is proportional to said rotational speed, means for repetitively establishing a predetermined time interval, counting means for repetitively counting the number of said pulses occurring in said predetermined time interval, and means for establishing said predetermined amplitude for said signal in dependence on the count in said counting means.

4,095,121

RESONANTLY ENHANCED FOUR-WAVE MIXING

Richard F. Begley, Los Alamos, and Norman A. Kurnit, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1977, Ser. No. 787,415
Int. Cl.[2] H03F 7/04
U.S. Cl. 307—88.3 **21 Claims**



1. A method for generating tunable infrared radiation by four-wave mixing in a molecular gas comprising the steps of:

generating a first coherent, variable excitation signal ω_1 which is near resonant with at least one infrared transition of said molecular gas;

generating second coherent, variable excitation signal ω_2 which is near resonant with at least one infrared transition of said molecular gas;

irradiating said molecular gas with said first and second coherent, variable excitation signals in a waveguide to increase focal interaction length and enhance phase matching to increase efficiency;

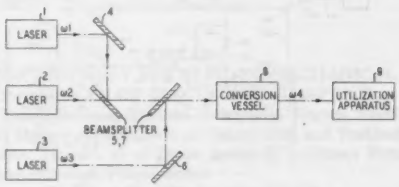
whereby $\omega_1 - \omega_2$ is resonant with a Raman allowed rotational transition thereby enhancing third order susceptibility and intensity.

4,095,122

TUNABLE INFRARED AND FAR-INFRARED SOURCE BY FOUR-PHOTON MIXING

Theodour Charlouis Damen, Colts Neck; Erich Gornik, Red Bank; Van-Tran Nguyen, Holmdel, and Chandra Kumar Naranbhai Patel, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 4, 1977, Ser. No. 821,699
Int. Cl.[2] H02M 5/04
U.S. Cl. 307—88.3 **4 Claims**



1. An apparatus for generating tunable infrared radiation comprising first, second and third input lasers generating input beams of frequency ω_1, ω_2 and ω_3, respectively

a nonlinear interaction medium comprising a crystal having exciton states,

means for directing said input beams collinearly into said nonlinear interaction medium, whereby an output frequency ω_4 is generated, where

$$\omega_4 = \omega_1 + \omega_2 - \omega_3,$$

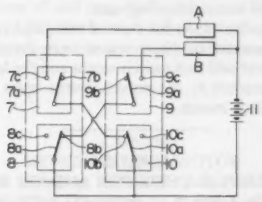
in which apparatus ω_1 and ω_2 are selected such that ω_1 is close to the frequency of a single-photon exciton state and the sum of ω_1 and ω_2 is very close to the frequency of a two photon exciton state, so that the output power of frequency ω_4 is resonantly enhanced by both of said exciton states.

4,095,123

SWITCH CONTROLLER

Naoyuki Takahashi, Hino, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,841
Claims priority, application Japan, Jun. 28, 1976, 51-84860[U]
Int. Cl.[2] H01H 3/12
U.S. Cl. 307—115 **4 Claims**

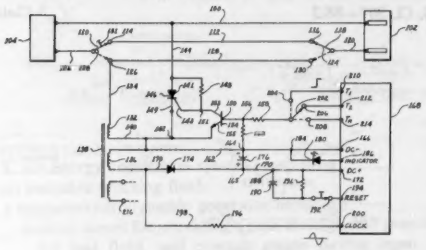


1. A switch controller comprising a first and a second push-button each carrying a pair of actuator pins of different lengths, first and second normally open switches respectively located below each shorter one of the actuator pins, and first and second normally closed switches respectively located below each longer one of the actuator pins, the first normally open switch and the second normally closed switch being connected in series in a first controlled circuit, and the first normally closed switch and the second normally open switch being connected in series in a second controlled circuit.

4,095,124
TRANSFORMER/SWITCH DEVICE

John J. O'Farrell, Jr., 2525 N. Alvernon Way, C-6, Tucson, Ariz. 85712

Filed Aug. 16, 1976, Ser. No. 714,314
Int. Cl.[2] H01H *43/00*
U.S. Cl. 307—141.4 21 Claims



1. An integrated transformer and switch device for controlling the flow of electrical power from a power source to a load, said device comprising:

a. a transformer means including a primary winding means electrically energizable by the power source for generating a magnetic field and a secondary winding means for generating an output signal, said secondary winding means being magnetically responsive to the magnetic field generated by said primary winding means;

b. first switch means having a normally closed state and a normally open state for supplying power to said primary winding means, said first switch means being maintained in the normally open state during energization of said primary winding means;

c. second switch means in series with said primary winding means for maintaining a flow of power through said primary winding means upon switching of said first switch means to the normally open state, said second switch means having a conducting state and a non-conducting state;

d. a selectively positionable third switch means for electrically connecting the load to the power source, said third switch means having a first state electrically connecting the load to the power source when said first switch means is in the normally closed state and the second state electrically connecting the load to the power source when said first switch means is in the normally open state;

e. fourth switch means responsive to the electrical energy pulses provided by said secondary winding means for changing said second switch means from the conducting state to the non-conducting state;

whereby, dependent upon the state of said third switch means, the load is connected or disconnected from the power source upon actuation of said first switch means and the load is disconnected or connected to the power source upon actuation of said fourth switch means.

4,095,125
PULSE SIGNAL DETECTOR AND/OR FILTER

Edwin Coy Ingle, Julian, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 28, 1977, Ser. No. 773,006
Int. Cl.[2] H03K *9/08*
U.S. Cl. 307—234 18 Claims

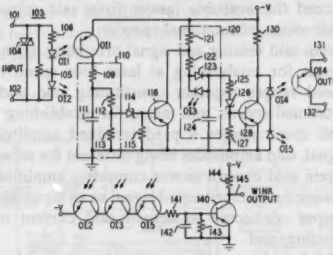
1. A pulse signal detector which comprises:

first timing means for yielding a first predetermined output only after being controllably enabled for a first predetermined interval in response to an applied input signal;

first means for yielding a first representation indicative of an operative state of said first timing means;

second timing means for yielding a second predetermined output only after being controllably enabled for a second predetermined interval in response to said first predetermined output;

second means for yielding a second representation indicative of an operative state of said second timing means; and

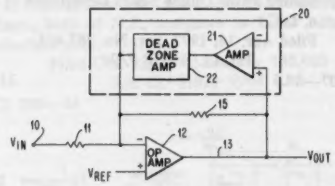


third means responsive to said first representation, said second representation and an output from said second timing means for yielding an indication when said applied signal has a width greater than said first predetermined interval and less than said first predetermined interval plus said second predetermined interval.

4,095,126
BI-POLAR AMPLIFIER WITH SHARPLY DEFINED AMPLITUDE LIMITS

Charles Reeves Hoffman, Raleigh, and William Burrell Nunnery, Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1977, Ser. No. 777,990
Int. Cl.[2] H03K *5/08*
U.S. Cl. 307—237 3 Claims



1. An amplitude limiting circuit for the output of a primary amplifier comprising an operational amplifier having a pair of input connections and an operational amplifier output terminal, a reference voltage source connected to one of said operational amplifier inputs, a resistor connecting said other of said operational amplifier input connections to a source of a signal to be amplified, and a resistor connecting said operational amplifier output terminal with said other operational amplifier input connection, said limiting circuit comprising:

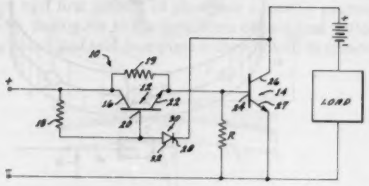
a primary amplifier having at least two inputs and two outputs with an input connected to said operational amplifier output terminal to generate on said two primary amplifier outputs an amplified representation of the signal at said operational amplifier output terminal; and

a dead zone amplifier having two inputs connected to the output of said primary amplifier and an output connected to the other said input of said primary amplifier and to said other input of said operational amplifier, said dead zone amplifier acting to generate a voltage signal of opposite polarity to said signal to be amplified when the amplitude of the output signal of said operational amplifier is outside of a predetermined zone.

4,095,127
TRANSISTOR BASE DRIVE REGULATOR

Arne Nerem, San Diego, Calif., assignor to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed Mar. 29, 1976, Ser. No. 671,094
Int. Cl.² H03K 17/60
U.S. Cl. 307—253 5 Claims

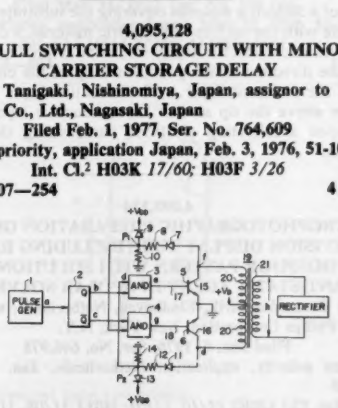


1. A base drive regulator for a first transistor having base, emitter and collector elements, which comprises,
(a) a source of base drive voltage,
(b) active single element regulator means for controlling said first transistor; said regulator means connected between said source and said base element of said first transistor,
(c) said regulator means including an additional transistor having a base, emitter and collector and responsive to said source and directly connected to said base of first transistor for supplying drive voltage to said base of said first transistor and,
(d) resistive bi-directional means connected between the emitter and collector of said additional transistor for maintaining a bias voltage on said base of said first transistor of a value above the normal voltage on said base of said first transistor when said additional transistor responsive to said source is non-conducting and a drive voltage is present, and
(e) a diode connected between the base of said additional transistor and the collector element of the first transistor so as to maintain a substantially zero differential voltage between said collector element and said base element of said first transistor.

4,095,128
PUSH-PULL SWITCHING CIRCUIT WITH MINORITY CARRIER STORAGE DELAY

Hidetoshi Tanigaki, Nishinomiya, Japan, assignor to Furuno Electric Co., Ltd., Nagasaki, Japan

Filed Feb. 1, 1977, Ser. No. 764,609
Claims priority, application Japan, Feb. 3, 1976, 51-10976
Int. Cl.² H03K 17/60; H03F 3/26
U.S. Cl. 307—254 4 Claims

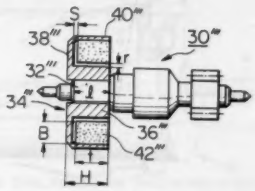


1. In a push-pull semiconductor switching circuit including an output transformer, first and second grounded emitter transistors whose collectors are connected to opposite ends of the primary winding of the transformer, and a pulse generator for alternately controlling the conduction of the transistors, the improvements characterized by:
(a) a flip-flop circuit for producing Q and $\overline{Q}$ output signals in response to the pulse generator,
(b) first and second AND gates each having one of its inputs respectively coupled to the Q and $\overline{Q}$ outputs of the flip-flop circuit, and their outputs connected to the bases of the first and second transistors, respectively,
(c) means connecting the collector of the first transistor to the other input of the second AND gate, and
(d) means connecting the collector of the second transistor to the other input of the first AND gate,
(e) each connecting means comprising a first resistor, a second, grounded resistor connected to the first resistor to form a voltage divider therewith, and a voltage limiter connected to the junction of the first and second resistors.

4,095,129
ROTOR ASSEMBLY FOR ELECTRO-MECHANICAL TRANSDUCER OF ELECTRONIC TIMEPIECE

Kunio Tanai, Sayama; Yasuaki Nakayama, Hanno; Yoshiro Hirai; Shigeru Aoyama, both of Tokorozawa, and Yoshinobu Kashima, Tanashi, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Sep. 15, 1976, Ser. No. 723,273
Claims priority, application Japan, Sep. 22, 1975, 50-1114557; Dec. 25, 1975, 50-159494; Jan. 21, 1976, 51-005751
Int. Cl.² H02K 37/00
U.S. Cl. 310—49 R 4 Claims



1. A rotor assembly for a stepping motor of an electronic timepiece comprising:
a rotor pinion;
a metallic protecting member including a boss portion fixedly mounted on said rotor pinion, a radial wall radially extending from said boss portion, and a cylindrical wall integral with said radial wall; and
a rare earth magnet press fitted to said cylindrical wall and having an inner wall larger in diameter than said boss portion to provide an annular space therebetween, said rare earth magnet being formed in a ring-shape and having an inner diameter less than about 4 mm, the ratio of the outer radius of said rare earth magnet to the inner radius thereof ranging between 1.2 and 3 and said rare earth magnet having an energy product of at least 16 MGOe.

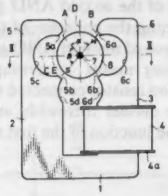
4,095,130
SYNCHRONOUS MOTOR

Kenji Oshima; Tomohisa Matsumoto; Hiroshi Yamazaki, and Tamotsu Yoshioka, all of Tokyo, Japan, assignors to Kabushiki Kaisha Seikosha, Japan

Filed Sep. 16, 1976, Ser. No. 723,950
Claims priority, application Japan, Sep. 23, 1975, 50-115199
Int. Cl.² H02K 21/00
U.S. Cl. 310—162 4 Claims

1. A synchronous electric motor comprising a stator having two spaced stator arms with like magnetic pole portions formed at fore ends thereof and opposing each other, an energizing coil on said stator, and a rotor rotatably disposed between said magnetic pole portions and having a pair of N- and S-poles, each of said magnetic pole portions having two static

magnetic poles at equal distance from said rotor and an indent between said poles spaced at a greater distance than said poles



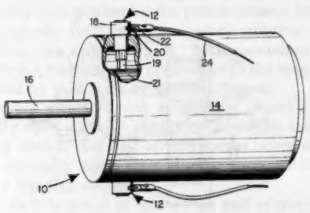
from said rotor, whereby said stator is quadripolar statically and bipolar dynamically.

4,095,131

BRUSH HOLDER FOR MOTOR OR GENERATOR

Richard J. Febonio, Salem, Mass., assignor to Torque Systems, Inc., Waltham, Mass.

Filed Jun. 17, 1976, Ser. No. 697,106
Int. Cl.[2] H02K *13/00*
U.S. Cl. 310—239 **5 Claims**



1. A brush holder for containing a carbon brush having an external terminal which includes a generally circular portion conforming to and disposable within a recess of the brush holder, and an outwardly extending tab, and comprising:

a unitary hollow body of electrically insulative material and including a head portion at one end thereof having a continuous wall defining an internally threaded recess;

said recess being configured to receive in threaded relationship a threaded cap therein for retention of a carbon brush in said body;

an opening extending through the body along the longitudinal axis thereof and of configuration to slidably contain a carbon brush disposed therein;

said head portion having a narrow slit therein communicating between the outer surface of said head portion and said recess at a portion adjacent to the bottom of said recess and extending transversely to the axis of said body, said slit adapted to receive the electrical terminal tab of a brush, said recess being adapted to receive the generally circular portion of the electrical terminal for retention by said threaded cap.

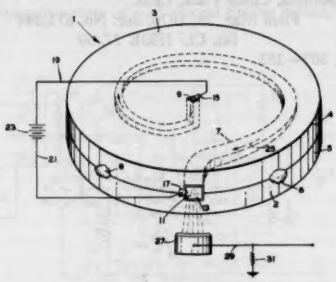
4,095,132

ELECTRON MULTIPLIER

Anthony V. Fraioli, Essex Fells, N.J., assignor to Galileo Electro-Optics Corp., Sturbridge, Mass.

Filed Sep. 11, 1964, Ser. No. 395,801
Int. Cl.[2] H01J *43/00*
U.S. Cl. 313—103 CM **9 Claims**

1. An electron multiplier comprising wall means of secondary electron emissive material defining a spiral passage, means for providing a current flow through said wall means to supply electrons for secondary emission, a resistance means provided in said wall means and connected in parallel across a portion of



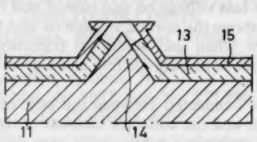
the spiral passage defined by said wall means to provide more uniform current multiplication along said passage length.

4,095,133

FIELD EMISSION DEVICE

Arthur Marie Eugene Hoeberechts, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1977, Ser. No. 780,963
Claims priority, application Netherlands, Apr. 29, 1976, 7604569
Int. Cl.[2] H01J *1/16, 1/05*
U.S. Cl. 313—336 **3 Claims**



1. A field emission device comprising a substrate on which at least one conical electrode having a punctiform tip is provided, a layer of a dielectric material covering the substrate about the electrode with the tip free of dielectric material, a conductive layer over said dielectric layer, said conductive layer extending in the direction of the punctiform tip of the electrode to beyond the dielectric layer, said conductive layer having an aperture above the tip so that the conductive layer forms a cap-shaped accelerating electrode surrounding the conical electrode.

4,095,134

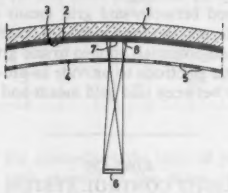
ELECTROPHOTOGRAPHIC PREPARATION OF COLOR TELEVISION DISPLAY TUBE INCLUDING RINSING PHOSPHOR PATTERN WITH SOLUTION OF ANTISTATIC AGENT IN APOLAR SOLVENT

Francis Bernardus Strik, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 6, 1976, Ser. No. 646,975
Claims priority, application Netherlands, Jan. 10, 1975, 7500288
Int. Cl.[2] G03G *13/10, 13/01;* H01J *31/08, 31/20*
U.S. Cl. 313—470 **4 Claims**

1. In the method of electrophotographically manufacturing a display screen for a color television display tube wherein a combustible conducting coating is first applied to the faceplate of said tube, a combustible photo-conducting coating is applied to said combustible coating, a first pattern of phosphor zones is formed on said combustible photo-conducting coating by first uniformly electrically charging said photo-conducting coating, forming a latent charge pattern with the charged portions corresponding to the desired phosphor zones of said first pattern by exposing to light the zones on said electrically

charged photoconducting coating between said desired phosphor zones, and then precipitating phosphor particles, having charges opposite to the charge on said unexposed portions of said electrically charged photo-conducting coating, from a suspension thereof in an apolar suspending medium, on said unexposed zones of said light electrically charged photo-conducting coating to thereby form the first pattern of phosphor zones, at least one subsequent pattern of phosphor zones is formed on said first pattern of phosphor zones by proceeding in a manner analogous to the formation of said first pattern of phosphor zones and said face-plate is then heated to remove by



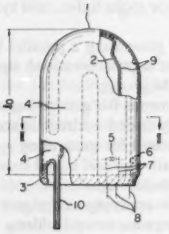
combustion said combustible conducting coating and said combustible photo-conducting coating, the improvement wherein after the formation of each phosphor pattern and before the formation of the subsequent charge pattern the resultant screen is wetted with a solution consisting essentially of an antistatic agent in an apolar solvent said antistatic agent being selected from the group consisting of soaps of bivalent metals, soaps of multivalent movalent metals and mixtures of said soaps, the conductivity of which soaps in said apolar solvent is between 5×10^{-12} and 10^{-10} ohm^{-1}cm^{-1} (500–10,000 p S/m) the electrical conductivity of which solvent is less than 10^{-4} ohm^{-1} cm^{-1} (1 p S/m) and dried.

4,095,135

SPHERICAL-BULB FLUORESCENT LAMP

Haruo Yamazaki, Moriyama, and Hidezoh Akutsu, Hyogo, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Mar. 16, 1977, Ser. No. 778,146
Claims priority, application Japan, Mar. 19, 1976, 51-30659
Int. Cl.² H01J *61/16, 61/30, 61/44*
U.S. Cl. 313—493 **1 Claim**



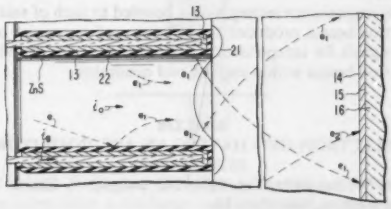
1. A fluorescent lamp comprising:
an outer bulb having a generally spherical or dome-shaped configuration;
an inner bulb disposed within said outer bulb, said bulbs being configured to define a zig-zag discharge path comprising a series of adjacent legs between the inner wall surface of the outer bulb and the outer wall surface of the inner bulb, the portions of said bulbs adjacent said path being spaced apart a distance in the range of 0.1 to 0.5 millimeter from each other to permit communication between adjacent legs of said path in a direction substantially perpendicular to said legs, the distance between said adjacent legs measured along said path being L, and the distance between adjacent legs measured in a direction substantially perpendicular to said legs being *l*;
an electrode at each end of said discharge path;
a radiation-emitting discharge gas comprising Neon, Argon or Krypton disposed in the space between said bulbs; and
a phosphor coating on a wall surface of one of said bulbs adjacent said discharge gas,
wherein the ratio of *l* to L is (i) at least 6:600 when said gas comprises Neon, (ii) at least 10:600 when said gas comprises Argon, (iii) at least 20:600 when said gas comprises Krypton, and (iv) at least $(6x_{Ne} + 10x_{Ar} + 20x_{Kr})$:600 when said gas comprises a mixture of Neon, Argon and Krypton, where x_{Ne}, x_{Ar}, and x_{Kr} are the volumetric mole fractions of Neon, Argon and Krypton respectively.

4,095,136

IMAGE TUBE EMPLOYING A MICROCHANNEL ELECTRON MULTIPLIER

Wilfrid F. Niklas, Portola Valley, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 28, 1971, Ser. No. 194,765
Int. Cl.² H01J *31/48*
U.S. Cl. 315—11 **3 Claims**



1. In an image tube, means for producing an electron image in the tube, a multichannel electron multiplier means having an electron image input face and an output face, means for accelerating and for directing said electron image upon the input face of said multichannel electron multiplier means for multiplying the electron current of said received image, an output means spaced from said output face of said electron multiplier means for receiving the multiplied output electron image of said electron multiplier means, metallic electrode means formed on the output face of said multichannel electron multiplier means for applying an operating potential to said output face of said electron multiplier means, said electrode means extending into the output ends of the channels and over the inside walls of said channels in said multichannel electron multiplier means, and a layer of semiconductive material overlaying said metallic electrode means, said semiconductive layer extending over said electrode means and into an output end portion of said channels, the remaining portion of said channels being free of said semiconductive material, for improving the information transfer of the electron image as directed from the output face of said multichannel electron multiplier onto said output means.

4,095,137

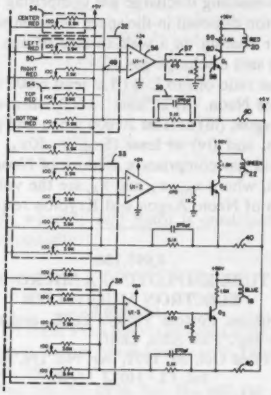
DIGITAL CONVERGENCE SYSTEM FOR A MULTI-GUN CRT

Robert Clement Oswald, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 18, 1977, Ser. No. 778,900
Int. Cl.² H01J *29/51*
U.S. Cl. 315—13 C **16 Claims**

1. A convergence correction system, comprising:
a CRT having a plurality of electron beam generating guns, a phosphor face comprised of a plurality of phosphor dots, four quadrants and a plurality of segments defined within each of said quadrants;
digital means for producing signals corresponding to the

horizontal and vertical coordinates of each of said segments; and,



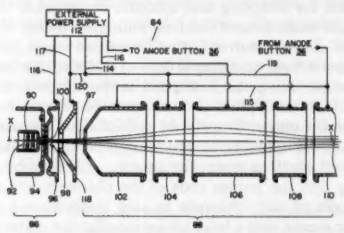
convergence correcting means coupled to each of said electron beams, produced by said guns, and responsive to said signals for independently converging the associated electron beams within each of said quadrants.

4,095,138

ELECTRON GUN HAVING AN ARC-INHIBITING ELECTRODE

James W. Schwartz, Deerfield, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 29, 1976, Ser. No. 745,889
Int. Cl.² H01J *29/46*
U.S. Cl. 315—16 **1 Claim**



1. For use in a television cathode ray tube having associated therewith a power supply for developing discrete supply voltages, an electron gun for receiving supply voltages from the power supply to produce a focused beam of electrons, comprising:

electron source means comprising cathode means and grid means; and

focus lens means for receiving electrons from said electron source means and a predetermined pattern of supply voltages from the power supply to form an electron spot at a distance from said electron source, comprising:

initial and final tubular end electrodes for receiving relatively high supply voltages;

a low voltage tubular electrode located between said initial and final electrodes for receiving a relatively low supply voltage; and,

intermediate voltage electrode means between said low voltage electrode and at least one of said end electrodes for receiving a relatively intermediate supply voltage, said lens establishing an extended, axially continuously active focusing field which is substantially shielded from external field disturbances and establishing an axial potential distribution which decreases steady in value from said initial end electrode to said low voltage electrode and increases steadily in value from said low voltage electrode to said final end electrode;

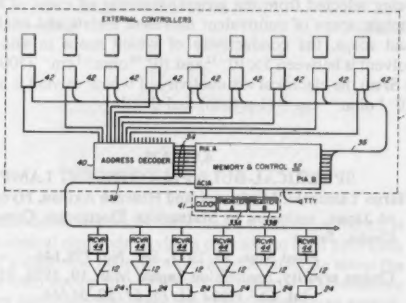
wherein said grid means receives an applied potential of such value that there exists a potential difference in the range of tens of kilovolts across the gap between said grid means and said initial end electrode of said focus lens means, said potential difference being sufficient to introduce a tendency towards destructive arcing between said grid means and said initial end electrode, said gun being characterized by having at least one arc-inhibiting electrode disposed between said grid means and said initial end electrode, and having a potential thereon that is intermediate to said potentials applied to said grid means and to said initial end electrode to provide an arc-inhibiting voltage gradient between said grid means and said initial end electrode.

4,095,139

LIGHT CONTROL SYSTEM

Alan P. Symonds, 14 Bobsled Dr., Needham Heights, Mass. 02194, and William K. Durfee, 3 Dana St., Apt. 8A, Cambridge, Mass. 02139

Filed May 18, 1977, Ser. No. 798,259
Int. Cl.² H05B *37/02, 39/04*
U.S. Cl. 315—153 **15 Claims**



1. A system for controlling the light intensity level of a light group including one or more lights, said system comprising, in combination:

control means for generating a parallel binary-coded signal representative of a predetermined signal level to be applied to said light group;

signal generating means for generating a unique and predetermined serially-coded address signal corresponding to said light group and for generating a serially-coded data signal representative of said signal level in response to said parallel binary-coded signal;

receiver means for applying said signal level to said light group only in response to said address signal and said data signal; and

a common bus for transmitting said address and data signals from said signal generating means to said receiver means.

4,095,140

TRIGGER CIRCUIT FOR FLASH LAMP DIRECTLY COUPLED TO AC SOURCE

Ellison H. Kirkhuff, Needham, and James C. Morris, Wakefield, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 7, 1977, Ser. No. 775,122
Int. Cl.² H05B *41/16, 41/30*
U.S. Cl. 315—199 **14 Claims**

1. In an electrical circuit for operating an arc discharge flash lamp which is directly coupled through series circuit means

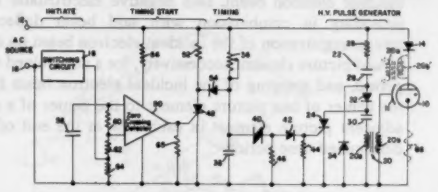
across a source of alternating current, a circuit arrangement for triggering said lamp comprising:

high voltage pulse generating means connected to said alternating current source to be energized thereby and coupled to said flash lamp for applying pulsed high voltage to ignite the lamp;

a timing circuit connected to said alternating current source to be energized thereby and coupled to said pulse generating means for controlling the time of pulsed ignition of said lamp with respect to the phase of the alternating current waveform of said source;

means for initiating operation of said circuit arrangement for triggering said lamp; and

circuit means responsive to said initiating means for starting said timing circuit at a predetermined point on said alternating current waveform.

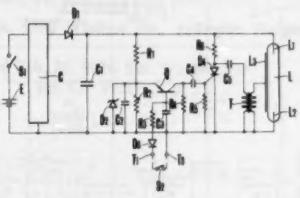


4,095,141

ELECTRONIC FLASH DEVICE

Zenzo Nakamura, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 658,123
Claims priority, application Japan, Feb. 21, 1975, 50/21573
Int. Cl.[2] H05B *41/32*
U.S. Cl. 315—241 P **7 Claims**



1. An electric flash device for a camera comprising:

(a) flash means for producing a light energy and having trigger and cathode electrodes;

(b) a capacitor coupled to said flash means for storing an electrical energy to be converted into the light energy in said flash means;

(c) a voltage divider circuit connected in parallel with said capacitor and having an output terminal;

(d) trigger pulse producing means coupled to said trigger electrode for supplying a trigger pulse to the trigger electrode of said flash means and including a thyristor having a control electrode;

(e) a PNP transistor coupled to the voltage divider circuit for impressing a voltage derived from the voltage divider circuit on the control electrode of said thyristor; the transistor having an emitter electrode connected to an output terminal of the voltage divider circuit, a collector electrode connected to the control electrode of said thyristor and a base electrode;

(f) a camera flash synchronizing switch connected to said base electrode of said PNP transistor for actuating the PNP transistor; and

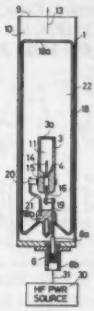
(g) a one-way conductive element connected in series with said synchronizing switch to prevent high voltages at the synchronizing switch from appearing at said PNP transistor.

4,095,142

HIGH FREQUENCY DISCHARGE LAMP FOR A SPECTRAL-LINE SOURCE

Seiichi Murayama, Kokubunji; Manabu Yamamoto, Odawara; Masaru Ito, Kodaira; Makoto Yasuda, Kokubunji, all of Japan; Makoto Watanabe, Hinsdale, Ill., and Kunifusa Kayama, Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 24, 1977, Ser. No. 762,174
Claims priority, application Japan, Feb. 2, 1976, 51-9378
Int. Cl.[2] H05B *41/24, 9/00*
U.S. Cl. 315—248 **3 Claims**



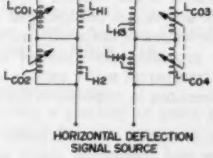
1. A high frequency discharge lamp for a spectral-line source comprising a discharge envelope which is made of an electrically-insulating material and at least a part of which has a transmissivity for spectral lines, a filling substance which is contributive to radiation of the several spectral lines and which is contained in said discharge envelope, an electrode which is provided in said discharge envelope, a casing having the interior evacuated to a vacuum and at least a part of which has a transmissivity for the spectral lines, said discharge envelope being disposed in said casing, a metallic container which surrounds said casing and said discharge envelope and which has at a part thereof an opening for taking out the spectral lines, and voltage supply means for supplying a high frequency voltage between said electrode and said metallic container.

4,095,143

ELECTRON BEAM CROSSOVER CORRECTION CIRCUITRY

Lawrence W. Pridmore, Elba, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jul. 21, 1976, Ser. No. 707,190
Int. Cl.[2] H01J *29/56*
U.S. Cl. 315—370 **4 Claims**



1. In a color cathode ray tube deflection system having horizontal and vertical axis and an in-line color cathode ray tube providing planar electron beams and an associated toroid-wound deflection yoke having first and second horizontal

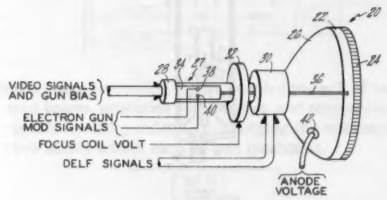
deflection windings oppositely disposed about said vertical axis and coupled to a horizontal deflection signal source and each horizontal winding having first and second series connected winding portions oppositely disposed about said horizontal axis, an electron beam crossover compensating circuit comprising an adjustable ganged and differentially connected inductance impedance means shunting all of at least one of said first and second winding portions of one of said first and second horizontal deflection windings to effect an imbalance of current in said first and second winding portions of at least one of said first and second horizontal deflection windings.

4,095,144

MASK-LESS SINGLE ELECTRON GUN, COLOR CRT

Charles Mendelsohn, Monsey, N.Y., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 17, 1976, Ser. No. 751,560
Int. Cl.[2] H01J *29/80*
U.S. Cl. 315—375 **19 Claims**



1. A color cathode ray tube (CRT) for providing a color video display in response to video signals, horizontal and vertical deflection signals, anode voltage signals, electron beam focusing signals, and electron beam modulation signals, presented from a system having s source of video signals, a source of horizontal and vertical deflection signals, a source of anode voltage signals, a source of electron beam focusing signals, and a source of electron beam modulation signals, comprising:

a vacuum envelope having a hollow funnel portion with a large diameter flared end enclosed in a vacuum sealing relationship by a faceplate portion and a small diameter tapered end disposed in a vacuum sealing relationship with a hollow neck portion extending rearward from said funnel portion along a central longitudinal axis thereof, said faceplate portion having a transparent major surface;

electron gun means, disposed inside said neck portion along said longitudinal axis and connected for response to the source of video signals, the source of anode voltage signals, and the source of beam modulation signals, for providing a hallow electron beam having a determined instantaneous inner and outer diameter in dependence on the magnitude of the beam modulation signals and having a beam axis coincident with said longitudinal axis, said electron gun means providing said hollow electron beam at an emitted current density in dependence on the magnitude of the video signal;

electron beam deflection means, disposed on the outside surface perimeter of said vacuum envelope at the junction of said neck and funnel portions and connected for response to the source of horizontal and vertical deflection signals, for providing deflection of the electron beam across said transparent major surface in each of two orthogonal directions in response to the deflection signals; and

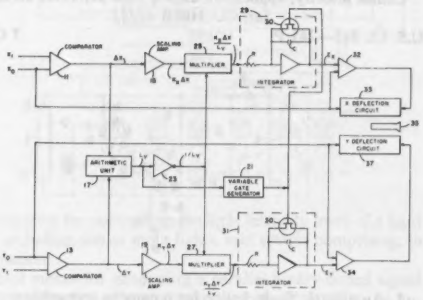
a video screen formation, disposed inside said vacuum glass envelope on said transparent major surface, said video screen formation including a plurality of noncontiguous picture elements disposed substantially in a matrix configuration of rows and columns, each of said picture elements having a determined surface area boundary and each including a plurality of different color phosphors disposed in a determined concentric pattern within the determined surface area boundary, said video screen formation further including a high work function dielectric material disposed interposingly with said plurality of picture elements on said transparent major surface for providing in response to bombarding electrons from the incident hollow electron beam, an electrostatic field which is negative with respect to the anode voltage signal and which has a gradient in a direction opposed to the trajectory of the incident electron beam, said negative electrostatic field providing in combination with said beam deflection means, registration of the incident electron beam on each of said picture element successively, for a determined time period, and stepping of the incident electron beam from the center of one picture element to the center of a next adjacent picture element in each row at the end of the determined time period.

4,095,145

DISPLAY OF VARIABLE LENGTH VECTORS

A. P. Terranova, North Andover, and F. J. Murphy, Billerica, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 13, 1976, Ser. No. 750,107
Int. Cl.[2] H01J *29/52*
U.S. Cl. 315—383 **6 Claims**



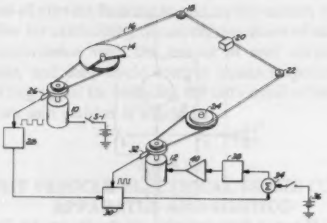
1. A variable length vector display circuit comprising: a cathode ray tube having X deflection means and Y deflection means; first and second comparators each having first and second inputs disposed to receive input voltage signals and an output; first and second operational amplifier sweep generators each having an input, an output, and a control input; the input of said first sweep generator being coupled to the output of said first comparator and the input of said second sweep generator being coupled to the output of said second comparator, the output of said first sweep generator being coupled to the X deflection means of said cathode ray tube and the output of said second sweep generator being coupled to the Y deflection means of said cathode ray tube; an arithmetic unit having first and second inputs and an output, said first input being connected to the output of said first comparator and said second input being connected to the output of said second comparator; a variable gate generator having an input coupled to the output of said arithmetic unit and an output coupled to the respective control inputs of said sweep generators for gating said sweep generators to controllably vary the sweep output voltage of said generators coupled to said deflection means.

4,095,146

REEL-TO-REEL DRIVE WITH SPEED CONTROL

Donald R. Spaman, and David C. Schilke, both of Middletown, Conn., assignors to Raymond Engineering Inc., Middletown, Conn.

Filed May 10, 1976, Ser. No. 685,077
Int. Cl.[2] H02P 5/46
U.S. Cl. 318—7 18 Claims



1. A method for minimizing the linear speed variations of a strip being drawn off a supply reel and delivered to a take-up reel comprising the steps of:

sensing the speed of the supply reel;

sensing the speed of the take-up reel;

determining the product of the speeds of the supply and take-up reels; and

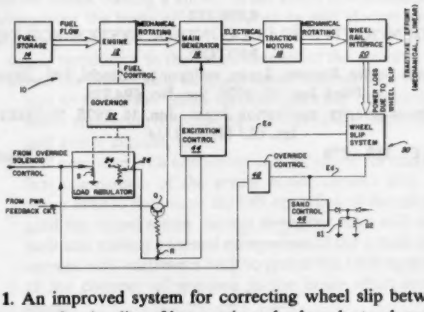
varying the speed of the take-up reel to maintain the product of the speeds of the supply and take-up reels constant whereby the linear speed of the strip will be maintained approximately constant.

4,095,147

WHEEL SLIP CORRECTION METHOD, SYSTEM AND APPARATUS

John M. Mountz, 1503 Windsor Dr., Arlington Heights, Ill. 60004

Filed Feb. 26, 1976, Ser. No. 661,509
Int. Cl.[2] H02P 5/50
U.S. Cl. 318—52 17 Claims



1. An improved system for correcting wheel slip between any one of a plurality of locomotive wheels and a track occurring in response to the application of power to said wheels for rotating said wheels along a track to move the locomotive relative said track, the improvement comprising:

means common to said wheels for deriving a first signal proportional to locomotive speed;

means controlled by said first signal for deriving a respective correction signal for each wheel proportional to the power dissipated by the respective wheel in response to a slip condition of the respective wheel;

means for utilizing each correction signal for controlling the slip condition of the respective wheel to eliminate the slip; and

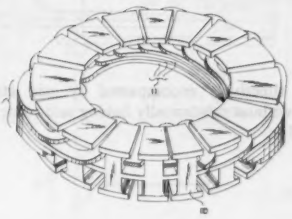
memory means operated by said correction signal for retaining said first signal until said slip condition is eliminated.

4,095,148

DIRECT CURRENT MOTORS

Louis W. Parker, 2408 Sunrise Key Hwy., Fort Lauderdale, Fla. 33304

Filed Jul. 22, 1976, Ser. No. 707,578
Int. Cl.[2] H02K 23/00
U.S. Cl. 318—138 17 Claims



1. A direct current motor comprising a stator consisting of a plurality of coils connected in series with one another in a closed loop configuration, means connecting the junction between adjacent pairs of said coils to diametrically opposed ones of said junctions in said closed loop coil configuration, a plurality of pairs of oppositely poled silicon controlled rectifiers connected respectively to the junctions of different adjacent pairs of said coils for selectively conducting current into and out of said stator coil junctions, a direct current source for energizing each of said pairs of silicon controlled rectifiers, a rotor mounted for rotation adjacent said stator, means including a distributor driven by said rotor for energizing the gate electrodes of different ones of said silicon controlled rectifiers in sequence thereby to produce a plurality of stator poles which are angularly displaced from the rotor poles and which stator poles shift in position about said closed loop coil configuration with rotation of said rotor, centrifugal switch means coupled to said rotor, and control means responsive to the operating state of said centrifugal switch means for controlling the possible conduction of said silicon controlled rectifiers to effect a starting mode of operation when said rotor is rotating below a predetermined speed and to effect a running mode of operation different from said starting mode when said rotor is rotating above said predetermined speed, said centrifugal switch means and said control means being operative to prevent continuous conduction of any of said silicon controlled rectifiers in said starting mode of operation and being operative to permit continuous conduction of different successive ones of said pairs of rectifiers in said running mode of operation.

4,095,149

OPTIMIZED ELECTRIC MOTOR HAVING CONTROLLED MAGNETIC FLUX DENSITY

Cravens L. Wanlass, 9871 Overhill Dr., Santa Ana, Calif. 92705

Filed Apr. 7, 1976, Ser. No. 674,406
Int. Cl.[2] H02P 1/44
U.S. Cl. 318—220 A 21 Claims

1. An electric motor comprising:

a stator core including a plurality of poles and magnetic material joining said poles;

a rotor;

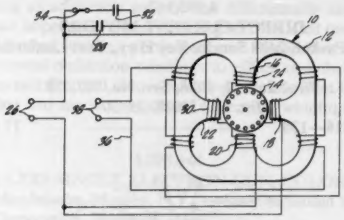
main stator winding means wound on said core and encompassing the magnetic material to generated magnetic flux which links said rotor;

an input adapted to be connected to a source of AC voltage;

capacitor means;

means connecting the main stator winding means and said capacitor means in a series circuit across said input; and

means for introducing a control magnetic flux into said joining magnetic material to vary the amount of magnetic



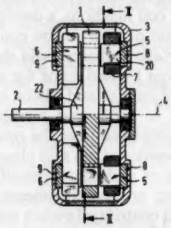
material effectively encompassed by said main stator winding without substantially linking said rotor with said control flux.

4,095,150

TWO-PHASE ASYNCHRONOUS MOTOR

Karlheinz Senckel, Goethering 54, 8015 Markt Schwaben, Germany

Filed Jul. 12, 1976, Ser. No. 704,466
Int. Cl.² H02K *1/00*
U.S. Cl. 318—227 **10 Claims**



1. A two-phase asynchronous motor comprising:

a stator having stator windings, said stator including a first stator portion and a second like stator portion spacedly disposed parallel to said first stator portion, said stator portions including ferromagnetic cores which together with said stator windings define field magnets, said cores having widened pole shoes, and said stator windings being arranged in said stator portions on said ferromagnetic cores, the stator windings of one phase being accommodated in said first stator portion only and the stator windings of a second phase being accommodated in said second stator portion only, said stator windings being displaced with respect to each other in a direction of movement according to the phase angle; and,

a member arranged between said stator portions and mounted for movement with respect thereto, said member including a short-circuit electrically conductive element of planar configuration adapted for induction therein of an electrical current by said field magnets and further including ferromagnetic bridges magnetically separated from each other by said short-circuit element and extending from one side of said element to the other and including broadened end plates thereon,

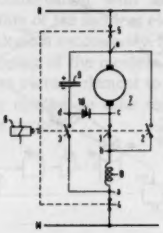
wherein said pole shoes and said end plates will complete a magnetic circuit between two adjacent stator poles of one stator portion directly via a pole shoe of said other stator portion.

4,095,151

CIRCUIT ARRANGEMENT FOR AN A-C SERIES MOTOR

Paul Mourick, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sep. 15, 1976, Ser. No. 723,549
Claims priority, application Germany, Sep. 15, 1975, 2541113
Int. Cl.² H02P *3/12, 3/00*
U.S. Cl. 318—266 **1 Claim**



1. In a circuit arrangement for an a-c series motor having an armature and a field winding with a switching device for changing from motor to braking operation comprising:

a. a first switch contact between the armature winding and the field winding;

b. a second switch contact across a series circuit consisting of the first switch contact and the armature winding;

c. a third switch contact across the series circuit consisting of the first switch contact and the field winding;

d. a capacitor and a charging diode in series associated with the a-c series motor, the improvement comprising;

e. the series circuit consisting of the capacitor and the charging diode shunting the armature winding; and

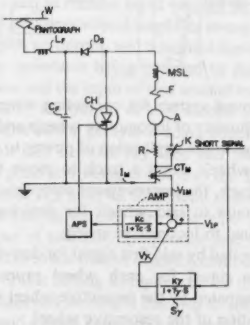
f. the third switch contact disposed between the center of said series circuit consisting of the capacitor and the charging diode and the external terminal of the field winding, whereby in motor operation a series circuit consisting of the capacitor, the charging diode and the field winding is connected between the terminals of the a-c series motor and, during braking operation, the field winding is shunted by the capacitor.

4,095,152

REGENERATIVE BRAKE CONTROL SYSTEM FOR DC MOTOR

Hiroshi Narita, Katsuta, Japan, assignor to Hitachi, Ltd., Japan

Filed Jun. 10, 1976, Ser. No. 694,726
Claims priority, application Japan, Jun. 16, 1975, 50-71883
Int. Cl.² H02P *3/14*
U.S. Cl. 318—376 **6 Claims**



1. A regenerative brake control system for DC motors comprising

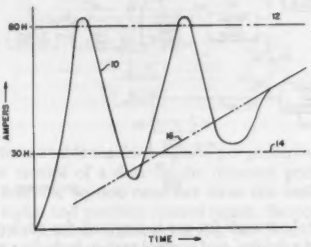
a series circuit including a DC motor circuit and a resistor, means responsive to a shorting signal for shorting said resistor, a chopper connected in parallel with said series circuit, a filtering circuit including a filtering capacitor connected through a diode to said parallel circuit of said chopper and said series circuit, and a power supply connected to said filtering circuit, current control means for controlling the duty cycle of said chopper in accordance with the deviation between a current command and the value of current flowing in said motor circuit, and a phase shifter for controlling the on-off operation of said chopper in accordance with the output of said current control means, and duty cycle control means responsive to said shorting signal for reducing the duty cycle of said chopper before said resistor is shorted.

4,095,153

TRANSIT VEHICLE ELECTRICAL BRAKE CONTROL APPARATUS AND METHOD

Thomas C. Matty, North Huntingdon, and James H. Franz, Jr., Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1976, Ser. No. 709,684
Int. Cl.² H02P *3/14*
U.S. Cl. 318—376 **11 Claims**



1. In control apparatus for a chopper responsive to a brake effort request signal for determining an ON operation and an OFF operation and being operative with a transit vehicle electric motor having a known brake effort characteristic for determining the brake effort provided by said electric motor, the combination of:

means responsive to the actual current of the motor,

means for establishing an upper motor current limit in relation to said brake effort characteristic and establishing a lower motor current limit in relation to the provision of said motor current, and

means operative with said actual motor current for making a first comparison of the actual motor current with said upper limit to determine the ON operation of the chopper until the actual motor current is greater than said upper limit and making a second comparison of the actual motor current with said lower limit to permit the OFF operation of the chopper in response to the brake effort request signal.

4,095,154

REGENERATIVE BRAKING SYSTEM FOR A CHOPPER CONTROLLED ELECTRIC TRACTION MOTOR

Dennis F. Williamson, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Oct. 18, 1976, Ser. No. 744,591
Int. Cl.² H02P *3/14*
U.S. Cl. 318—376 **29 Claims**

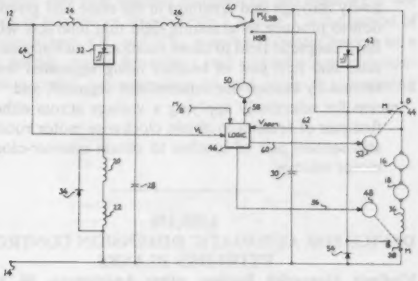
1. A d-c electric traction motor control system comprising:

a. first and second source terminals adapted for connection to a d-c power source;

b. a first d-c electric traction motor operable in a motoring mode and in an electrical braking mode;

c. power control means responsive to a command signal for regulating current therethrough;

d. switch means operable during said motoring mode to serially connect said power control means and an armature of said traction motor between said first and second source terminals whereby electrical energy may be provided to said traction motor, said switch means being operable during said electrical braking mode to serially connect said power control means in a reverse direction



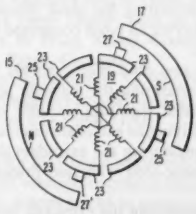
whereby electrical energy may be transferred from said traction motor armature to said source terminals through said power control means when the terminal voltage magnitude of said traction motor exceeds the voltage magnitude at said source terminals, and said switch means being operable when said terminal voltage magnitude of said traction motor is less than said voltage magnitude at said source terminals during said electrical braking mode to connect said power control means in parallel circuit arrangement with said traction motor between said source terminals.

4,095,155

DIRECTION REVERSING DIRECT CURRENT MOTORS AND THEIR CONTROL

Ronald Robert Brooks, Hamilton Square, and Jack Edward Wojslawowicz, Bayonne, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,650
Claims priority, application United Kingdom, Mar. 13, 1975, 10516/75
Int. Cl.² H02P *3/00*
U.S. Cl. 318—541 **7 Claims**



1. A rotation reversing direct current motor apparatus, comprising:

a stator for providing a fixed magnetic field;

an armature mounted for rotation in said magnetic field, said armature having a plurality of both electrically independent windings and commutator segments radially distributed about the rotational axis thereof, said commutator segments being electrically isolated from one another, and

each of said windings being successively connected between two of said opposingly disposed commutator segments;

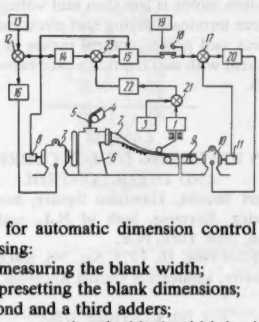
first and second pairs of opposingly disposed brushes fixedly mounted relative to said stator for electrically and mechanically contacting said commutator segments, said first pair of brushes being disposed for passing current of a given polarity successively through said windings in a given direction to produce an armature field that interacts with said fixed magnetic field to cause rotation in one direction and said second pair of brushes being disposed for passing current of the same said given polarity successively through said windings in the same said given direction to produce an armature field that interacts with said fixed magnetic field to cause rotation in an opposite direction, said first pair of brushes being separated from the second by at least one commutator segment; and

means for selectively applying a voltage across either said first pair of brushes to obtain clockwise motor rotation or said second pair of brushes to obtain counter-clockwise motor rotation.

4,095,156
DEVICE FOR AUTOMATIC DIMENSION CONTROL OF EXTRUDED BLANKS

Vladimir Alexeevich Borisov, ulitsa Andrianova, 38, kv. 35; Ravil Abdrakhmanovich Akhmedzhanov, ulitsa Tsiolkovskogo, 4a, kv. 14, and Jury Vsevolodovich Chistyakov, prospekt Mira, 2b, kv. 47, all of Omsk, U.S.S.R.

Filed Mar. 21, 1977, Ser. No. 779,535
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—571 **1 Claim**



1. A device for automatic dimension control of extruded blanks, comprising:

a means for measuring the blank width;

a means for presetting the blank dimensions;

a first, a second and a third adders;

said means for measuring the blank width having an output connected to an input of said third adder;

said third adder having a second input connected to said means for presetting the blank dimensions; an amplifier-converter having an input connected to the output of said third adder;

an extruder screw drive motor; socket when seperated

a sensor for measuring the extruder screw rpm, kinematically associated with said extruder screw drive motor; a motor for driving an extrudate drawing-off device; means.

a sensor for measuring the extrudate draw-off speed, kinematically associated with said drawing-off device drive motor;

a means for presetting the extrudate draw-off speed; axis

inputs of said first adder, connected, respectively, to said extruder screw rpm presettting means and to said extruder screw rpm sensor;

a first and a second amplifiers;

sad first adder having an output connected, via said first amplifier, to said extruder screw drive motor;

said second adder having a first input connected to said draw-off speed sensor;

said second adder having an output connected, via said second amplifier, to said drawing-off device drive motor;

a compensator unit;

a fourth adder having a first input connected to the output of said compensator unit;

said compensator unit having an input connected to said extruder screw rpm sensor;

a nonlinearity unit having a first input connected to the output of said fourth adder and a second input connected to said extruder screw rpm sensor and receiving a bias voltage;

said amplifier-converter having an output connected to a second input of said fourth adder;

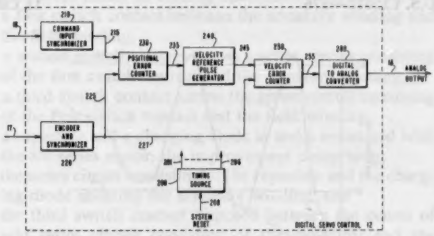
a switch;

said nonlinearity unit and draw-off speed sensor having outputs connected to a first input of said third adder via said switch.

4,095,157
DIGITAL SERVOMECHANISM CONTROL SYSTEM

John G. Klauser, Holliston, Mass., assignor to Boston Digital Corporation, Hopkinton, Mass.

Filed Sep. 7, 1976, Ser. No. 721,318
Int. Cl.[2] H02P *5/00*
U.S. Cl. 318—603 **14 Claims**



1. A control network for use in a system for controlling the movement of a device, said control system including means for moving said device, a source of a command signal representing desired movement of the device, a source of a sensed signal representing the actual movement of said device, said command and sensed signals being pulse trains in which each pulse represents an incremental displacement of said device, so that the speed of movement is encoded in the repetition rate of the pulses, said network comprising; timing pulse generator means includng a single clock pulse source operative to produce timing signals having particular repetition rates defined by said clock pulse source, respectively, for controlling operations to be performed by said network, first counter means coupled to said command signal source and said sensed signal source for producing a first positional error signal functionally related to the difference between the desired and actual positions of said device, reference generator means coupled to said timing generator means and said first counter means for generating a reference pulse signal in response to both said timing signals and said first positional error signal, said reference pulse signal having a repetition rate functionally related only to the magnitude of said first positional error signal, and output means coupled to said reference generator means for applying an output signal corresponding to said reference pulse signal to said device moving means.

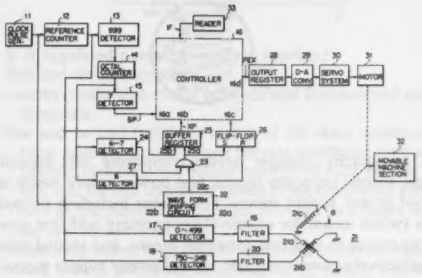
4,095,158
POSITION-CONTROLLING SYSTEM

Mitsuo Matsumoto, Kokubunji, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 20, 1976, Ser. No. 724,863
Claims priority, application Japan, Sep. 19, 1975, 50-112722
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—603 **5 Claims**

1. A position-controlling system for calculating, upon re-

ceipt of a position-controlling instruction changing with time, each instructed position incremental moving value of a movable machine section per prescribed period of time, thereby to control the position of the movable machine section through a servo system, which comprises a reference counter for periodically providing a referential pattern numeral upon receipt of a clock pulse issued from a clock pulse oscillator; a phase type position detector for shaping an exciting waveform from a count made by the reference counter, thereby to detect the momentarily changing position of the movable machine section; means for producing a sampling control signal and a detection control signal from an output from the reference counter; a buffer register for storing the content of the reference counter according to a control signal supplied from the control signal-generating means and a phase data read out from the phase type position detector or preferably at a timing immediately preceding the sampling signal; and a controller for calculating each instructed position incremental moving



value of the movable machine section per prescribed period of time upon receipt of a data on the detected position of the movable machine section read out from the buffer register, sampling signal and position control signal, thereby giving an accumulative position errors occurring per prescribed period of time; the controller comprising a calculating unit for calculating a numeral denoting each instructed incremental moving of the movable machine section per prescribed period of time from a position-controlling instruction; means for accumulatively adding a numeral denoting each instructed incremental moving of the movable machine section for each said prescribed period of time; means for carrying out the accumulative subtraction of each detected actual incremental moving of the movable machine section read out from the buffer register for each said prescribed period of time; and a position error register for generating an output denoting an actual position error per prescribed period of time from a difference between outputs from the addition and subtraction means.

4,095,159

ELECTRONIC APPARATUS FOR AUTOMATIC CLOSED LOOP POSITIONING OF MOBILE MEMBERS ASSOCIATED WITH AN ELECTROMAGNETIC TRANSDUCER WITH TWO PAIRS OF WINDINGS

Paolo Tirelli, Taino (Varese), Italy, assignor to Exo Elettronica Industriale S.r.l., Milan, Italy

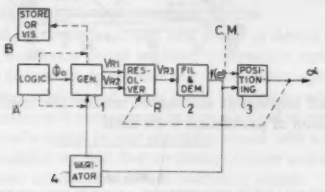
Filed Dec. 9, 1975, Ser. No. 639,126
Int. Cl.[2] G05B *19/30*
U.S. Cl. 318—605 **5 Claims**

1. In a system responsive to the relative position of first and second relatively movable members of a measuring device, one of said members having a pair of windings disposed in quadrature and the other of said members likewise having a pair of windings disposed in quadrature, said members being relatively movable between a first portion in which the pairs of windings are aligned and other positions in which the pairs of windings are rotatably displaced from said first position, the combination of:

circuit means connected to one pair of said windings for applying respective voltages VR_1 and VR_2 thereto whereby voltages VR_3 and VR_4 appear at the respective windings of said other pair; and

demodulating means connected to one winding of said other pair for demodulating one of said voltages VR_3 and VR_4 to recover an error voltage $f(e)$ proportional to the phase $\phi_o - \alpha$ where α is the relative angular position of said other pair of windings with respect to said one pair of windings and ϕ_o is an imaginary angle established by VR_1 and VR_2;

said circuit means comprising a first counter having an n bit output, clock means connected to said first counter for causing said first counter to count its full capacity 2^n for each of successive time periods T where T is the period of said voltages VR_1 and VR_2, a second counter having an n bit output, means for setting said second counter to contain a count corresponding to said angle ϕ_o, summing



means connected to the least significant $n-2$ bits of said first and second counters for producing the respective outputs Σ_{n-2} and Σ_{n-2} which respectively are the instantaneous sum and instantaneous differences of the count represented by said $n-1$ bits of said first counter and the count represented by said $n-2$ bits of said second counter, and voltage generating means having the following inputs:

(1) the two most significant bits of said first counter,

(2) the two most significant bits of said second counter,

(3) said instantaneous sum, and

(4) said instantaneous difference for producing said voltages VR_1 and VR_2 respectively in the form of bipolar pulse pairs of period T and having the pulses thereof of time duration corresponding to $2\phi_o$ and centered on T/4 and 3T/4 and bipolar pulse pairs of period T and having the pulses thereof of time duration corresponding to $2(90° - \phi_o)$ and centered on T/4 and 3T/4.

4,095,160

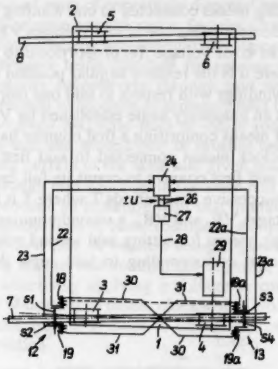
CONTROL ARRANGEMENT FOR CAUSING TRACK SUPPORTED IMPLEMENT TO REMAIN IN PARALLELISM WITH ITSELF

Franz Sedlmayer, and Peter Müller, both of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Jun. 4, 1976, Ser. No. 693,202
Claims priority, application Germany, Jun. 25, 1975, 2528293
Int. Cl.[2] G05B *11/01*
U.S. Cl. 318—675 **7 Claims**

1. A control device for causing an implement such as a crane having laterally spaced wheeled carriages rollingly supported on respective laterally spaced tracks to remain in parallel with itself while moving along the tracks; said device comprising in combination; pick-up means on at least one carriage spaced longitudinally along the carriage and also spaced laterally from the respective track and each operable to develop a signal in conformity with lateral movement of the pertaining region of the carriage on the respective track as brought about by movement of said implement out of a position of parallelism with itself, a comparator connected to receive said pick-up signals and operable to develop a control signal in conformity with the difference therebetween, and control means connected to

receive said control signal and operable in conformity with said control signal to apply corrective vertical axis influences

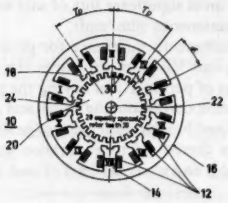


on said implement tending to restore the implement to said condition of parallelism with itself.

4,095,161
VARIABLE STEPPING-ANGLE SYNCHRONOUS MOTOR

Günter Heine, Seelbach, and Claus Schäffer, Heiligenzell, both of Germany, assignors to Gerhard Berger GmbH & Co. Fabrik Elektrischer Messgeräte, Lahr, Germany

Filed Jun. 15, 1976, Ser. No. 696,310
Claims priority, application Germany, Jun. 13, 1975, 2526564
Int. Cl.² G05B *19/40*
U.S. Cl. 318—696 **6 Claims**



1. In a five-phase stepping motor including

a permanent magnet rotor having on its periphery a plurality of circumferentially spaced, radially outwardly directed rotor teeth,

a stator surrounding said rotor and having a plurality of circularly arranged, radially inwardly directed stator poles disposed in u pole groups of five poles each, each of said stator poles having $n + 1$ pole teeth on its end face directed toward said rotor with n being a whole number $\geqq 0$, and

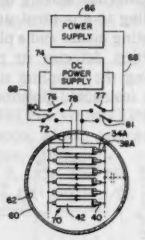
a corresponding plurality of stator windings wound about said stator poles, respectively, said stator windings forming a plurality of connecting points adapted to be selectively connected by respective control means to a power source for selective energization of said stator windings;

the improvement which comprises the provision, in combination with a single stator, of a set of eight rotors having respective different numbers of rotor teeth Z_R but with each such number defined by the relation $Z_R = 5u\,(n + 1) + gu$, where g is a whole number from 1 to 4, so that with one and the same stator and associated control of the stator windings the number of rotor teeth can be selectively varied to provide a motor with any one of eight different step angles.

4,095,162
CAPACITY CHANGER

Joseph Herman Arnold Peter Hiddink, 147 Burcher Road, Ajax, Ontario, Canada (L1S 2R6)

Filed Nov. 3, 1975, Ser. No. 627,899
Int. Cl.² H02M *9/04*; H01G *7/00*
U.S. Cl. 320—1 **9 Claims**

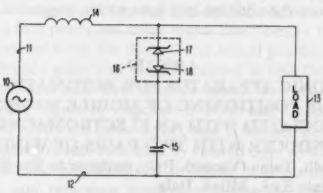


1. A capacity changer device comprising first capacitor means, second capacitor means, first power supply means and second power supply means, first means including normally open switch means for selectively connecting said first power supply means to said first capacitor means, and second means for selectively connecting said second power supply means to said second capacitor means, said first capacitor means including at least one evacuated air-free glass tube having an ionizable gas disposed therewithin, a pair of spaced electrodes disposed within said glass tube and having a corresponding electrode terminal extending outwardly through said glass, of said tube to the outside thereof, and said first connection means being operable to connect said first power supply means to said electrode terminals through said switch means.

4,095,163
TRANSIENT VOLTAGE SUPPRESSION CIRCUIT

Herbert R. Montague, Binghamton, N.Y., assignor to Control Concepts Corporation, Binghamton, N.Y.

Filed Jun. 1, 1976, Ser. No. 692,013
Int. Cl.² G05F *3/00*
U.S. Cl. 323—8 **8 Claims**



1. In a circuit having a source of varying electrical potential and a load connected across said source, a filter circuit for damping oscillations caused by transient noise pulses consisting of:

an inductor connected to one side of said source in series with said load;

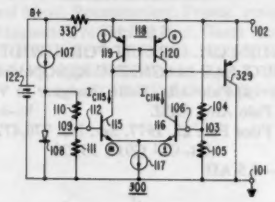
a capacitor connected between the load side of said inductor and the other side of said source in parallel with said load; and

breakdown means in series with said capacitor and having a predetermined breakdown potential.

4,095,164
VOLTAGE SUPPLY REGULATED IN PROPORTION TO SUM OF POSITIVE- AND NEGATIVE-TEMPERATURE-COEFFICIENT OFFSET VOLTAGES

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,796
Int. Cl.[2] G05F *1/56, 1/60*
U.S. Cl. 323—8 **37 Claims**



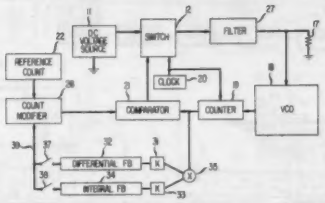
1. A regulated potential supply comprising:
first and second terminals;
current conductive means between said first and said second terminals;
first and second transistor means of the same conductivity type, each having an output current conduting path and a control terminal, the output current of each of said first and said second transistor means being controlled responsive to the potential appearing between its control terminal and said first terminal;
means responsive to potential appearing between said first and second terminals to continuously supply a fraction thereof between said first terminal and the control terminal of said first transistor means, which fraction is between zero and unity;
means for generating a negative-temperaturecoefficient potential;
means responsive to said negative-temperaturecoefficient potential to continuously supply a fraction thereof between said first terminal and the control terminal of said second transitor means, which fraction is between zero and unity;
means responsive to the difference between fixed proportions of the output currents of said first and said second transistor means for supplying an error signal, said fixed proportions chosen to cause said error signal to be substantially zero-valued when a positive-temperature-coefficient potential appears between the respective control terminals of said second and said first transistor means that summed with said fraction of negative temperature coefficient potential results in a substantially zero-temperature-coefficient potential; and
means responsive to said error signal to supply a current directly related in amplitude to said error signal to said second terminal, thereby completing a degenerative feedback loop for regulating the potential between said first and said second terminals to a substantially-temperature-independent voltage proportional to said substantially zero-temperature-coefficient potential.

4,095,165
SWITCHING REGULATOR CONTROL UTILIZING DIGITAL COMPARISON TECHNIQUES TO PULSE WIDTH MODULATE CONDUCTION THROUGH A SWITCHING DEVICE

Victor Bert Boros, New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 18, 1976, Ser. No. 733,058
Int. Cl.[2] G05F *1/56*
U.S. Cl. 323—17 **8 Claims**

1. A switching type voltage regulator comprising input means, output means, switching means coupling said input and output means, means for periodically initiating conduction in said switching means, a voltage controlled oscillator coupled to be responsive to a voltage magnitude at said output means, counting means responsive to an output of said voltage controlled oscillator, means for determining a difference in successive counts as accumulated by said counting means for recording a first count during one period of operation of said switching device and means coupled to said voltage controlled oscil-

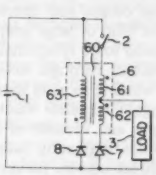


lator for counting down from said first count to derive a second count, a reference count register, comparator means, a first up-down counter coupling said reference count register to said comparator, said second count being coupled to said first up-down counter, said comparator means coupled to respond to an equality of a count in said counting means with a reference count modified by said first up-down counter and operative to terminate conduction in said switching means.

4,095,166
DC VARIABLE VOLTAGE DEVICE

Nobuho Shibata, Katano; Tutomu Seri, Kyoto; Norio Umezawa, Hirakata, and Takeshi Morofuji, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 15, 1976, Ser. No. 750,975
Claims priority, application Japan, Feb. 19, 1976, 51-17630; Mar. 3, 1976, 51-23571; Mar. 5, 1976, 51-24455; Mar. 25, 1976, 51-33365
Int. Cl.[2] G05F *1/58*
U.S. Cl. 323—17 **18 Claims**



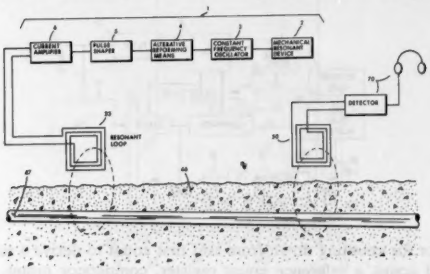
1. A DC variable voltage device comprising a first switch connected to one terminal of a DC power supply,
a transformer having a first coil connected in series with said first switch,
said transformer having a second coil connected in series aiding with said first coil, said coils being mounted on a common magnetic core,
a diode interconnected between said second coil and another terminal of said DC power supply for preventing short-circuiting of said DC power supply when said core is saturated when said first switch is closed,
means for interconnecting a load between the junction between said first and second coils and said other terminal of said DC power supply, and
a circuit coupled to said transformer and to a terminal of said power supply for restoring to an initial state the flux variation in said core produced when said first switch is closed, whereby said load may be controlled by the alternate opening and closing of said first switch.

4,095,167

CONCEALED STRUCTURE LOCATING AND SURVEYING EXCITER

Harold James Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Division of Ser. No. 643,606, Dec. 22, 1975, Pat. No. 4,044,299.
This application Jun. 9, 1976, Ser. No. 694,386
Int. Cl.[2] G01V *3/10*; G01D *21/04*; G01V *3/08*
U.S. Cl. 324—3 **19 Claims**



1. An inductive exciter means which has the capacity to stimulate sympathetic electromagnetic vibrations of a constant frequency in a concealed structure for the purpose of locating and surveying the said concealed structure including in combination:

(a) stabilized oscillator means operative to produce a source of first alternating current frequency,

(b) alterative reforming means coupled to the output of said oscillator means wherein said reforming means is operative to produce a source of squared waveform second alternating current frequency signal the periodicity of which is derived from the said first alternating current frequency, wherein said reforming means includes an output means therefrom for providing said signal,

(c) current amplifier means, including an input means for accepting voltage pulses, said current amplifier means being operative to increase the elctrical amplitude of the said voltage pulses at the output of the said amplifier,

(d) resonant winding means of goodly size and high operating "Q" loosely inductively coupled to the said current amplifier means output and operative so as to cause an electromagnetic field of large proportions and area, such field being caused to be sympathetically coupled into the concealed structure through suitable orientation of the said resonant winding so as to inductively excite the said structure to again reradiate electromagnetic field lines along the length and breadth of the said structure at a replica rate of the originating inductive signal frequency,

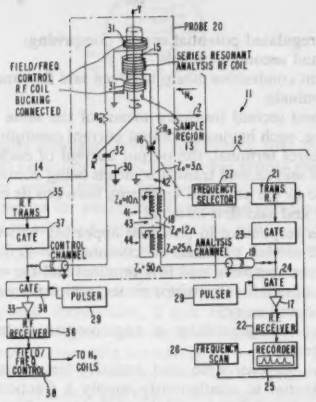
(e) a source of direct current power connected so as to be operative to provide the electrical operating potentials as required for the proper functioning of the said stabilized oscillator means, said alterative reforming means, and said current amplifier means, and pulse shaper means, consisting of at least one input and at least one output, wherein said pulse shaper is comprised of at least one resistor and at least one capacitor arranged in the general form of a differentiator with the input thereto operatively coupled to the said source of squared waveform second alternating frequency signal provided by the said reforming means output, and with the output thereto coupled to the said current amplifier means input, the time constant of said differentiator resistor and capacitor being somewhat shorter than the half-cycle period of the output signal from the reforming means, wherein said pulse shaper means produces output voltage pulses, in response to said inputed squared waveform second alternating frequency signal which are improved in waveform efficaciousness by reducing the width, or "on time", of the exciting drive pulse delivered through the said current amplifier means to the said resonant winding means until the amplitude of the induction field emanating from said winding means reaches a maximum, whereupon the said pulse width is, in a small degree, re-increased until the said issuing field just starts to decline in amplitude by not more than a few percent, such condition being found to be that which is necessary to provide sufficient power from the said current amplifier to overcome the losses sustained in the energy storage ability of the high "Q" resonant winding, yet prevent the said current amplifier from shunting, or loading, and thereby dissipating any significant portion of the stored energy contained in the said resonant winding.

4,095,168

RF PICK-UP COIL CIRCUIT FOR A WIDE TUNING RANGE NUCLEAR MAGNETIC RESONANCE PROBE

Lloyd F. Hlavka, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Feb. 22, 1977, Ser. No. 770,477
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—0.5 AH **12 Claims**



1. In a resonance pick-up circuit of a nuclear magnetic resonance spectrometer:

magnetic pick-up coil means disposed in radio frequency magnetic field exchanging relation to a nuclear magnetic resonance sample region for sensing nuclear magnetic resonance of a sample in the sample region;

tuning capacitor means series connected for RF current flow with said pick-up coil means for series resonating the inductance of said magnetic pick-up coil means at a nuclear magnetic resonant frequency of the resonance sample material;

transmission line transformer means series connected for the series resonant radio frequency current flow with said pick-up coil means and said tuning capacitor means at said series resonance frequency for transforming the relatively low series resonance impedance of said series resonated pick-up coil means to a substantially higher impedance of the input to a radio frequency amplifier;

said transformer means including first and second elongated conductors having an axially coextensive elongated portion, said transmission line comprising the distributed inductance and capacitance of said first and second coextensive conductors, said first conductor being series connected with said series resonated pick-up coil for flow of series resonant radio frequency current therethrough of one phase and for inducing a radio frequency current flow of opposite phase in said second conductor; and

means for coupling the induced current in said second conductor onto the end of said first conductor, which faces toward said pick-up coil means, in phase with the current flow in said first conductor so that at the end of said first conductor facing said pick-up means there is the sum of

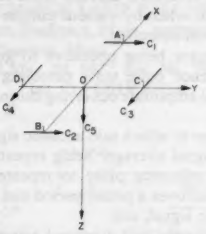
the current flow in said first and second conductors and at the opposite end of said first conductor, which faces toward the amplifier, there is only the series resonant current flow on said first conductor.

4,095,169

METHOD FOR LOCATING DISCONTINUITIES IN THE ELECTRICAL CONDUCTIVITY OF THE SUB-SOIL USING A PLURALITY OF MAGNETIC DETECTORS IN A PREDETERMINED SPATIAL ARRANGEMENT

Louis Marcel Musé, Rocquencourt, France, assignor to General Electro-Magnetic Prospecting, Inc., Santa Rosa, Calif.

Filed Mar. 9, 1976, Ser. No. 665,212
Claims priority, application France, Apr. 7, 1975, 75 10761
Int. Cl.[2] G01V *3/08, 3/00*
U.S. Cl. 324—8 **15 Claims**



1. A method for obtaining an indication of the electro-magnetic characteristics of the sub-soil underlying a ground surface comprising the steps of:

a. placing on the ground in a substantially horizontal plane at least four directional magnetic field detectors in two sets wherein each set comprises a spaced pair of detectors oriented in the same direction with the detectors of each set oriented at right angles to the detectors of the other set;

b. simultaneously monitoring the output signal from each of said detectors over a period of time, each of said output signals being made up of a plurality of spectral components;

c. electronically processing said output signals by characterizing each of said spectral components as being of the form $H = H_O e^{t/\tau}$ where t is time and τ is a time-constant to derive for each of said spectral components in each of said output signals a magnetic field amplitude value H_O;

d. combining amplitude values corresponding to the same spectral component from each of said output signals to obtain a non-variable physical parameter associated with said spectral component which is related to the electrical conductivity of the sub-soil beneath the detectors and is independent of any phase shift existing between the output signals from the pair of detectors in each of said sets.

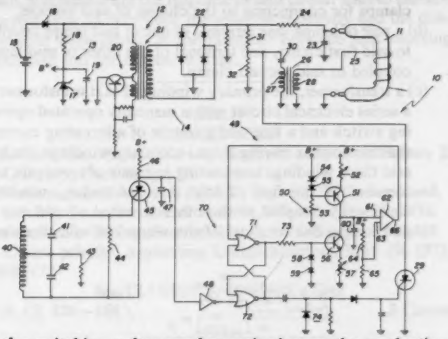
4,095,170

METERLESS IGNITION ADVANCE MEASURING DEVICE FOR INTERNAL COMBUSTION ENGINES

Herbert R. Schmitt, Lake Forest, Ill., assignor to Snap-on Tools Corporation, Kenosha, Wis.

Filed Dec. 6, 1976, Ser. No. 747,642
Int. Cl.[2] F02P *17/00*
U.S. Cl. 324—16 T **15 Claims**

1. In an advance measuring device having a strobe lamp and being adapted to determine the spark advance of an internal combustion engine having at least one spark plug and means for producing a sequence of spark voltages for the spark plug, the combination comprising: sawtooth signal generating means for generating a sawtooth signal each cycle of which has first and second portions, and threshold detector means coupled to said generating means and responsive to the instantaneous amplitude of said sawtooth signal exceeding a predetermined fixed threshold for producing a switching voltage, said generating means being coupled to said threshold detector means and being responsive to the switching voltage to initiate the first portion of each sawtooth signal cycle, said generating means being coupled to the spark producing means and being responsive to a spark voltage to initiate the second portion of each sawtooth signal cycle, the strobe lamp being responsive



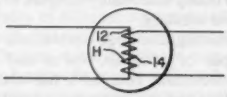
to the switching voltage and energized upon the production thereof, said generating means including means for varying the duration of the second portion of each sawtooth signal cycle to select the amount of delay between the occurrence of a spark voltage and the energization of the strobe lamp.

4,095,171

ALKALI METAL IONIZATION DETECTOR

James E. Bauerle, Plum Borough; William H. Reed, Monroeville, and Edgar Berkey, Murrysville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 7, 1976, Ser. No. 674,513
Int. Cl.[2] G01N *27/00*
U.S. Cl. 324—33 **10 Claims**



1. In an alkali metal ionization detector having a heated filament electrode for thermally ionizing alkali metal atoms or alkali metal-containing particles in a monitored gas environment to form positive ions and a source of electrical potential connected to a collector electrode to attract the positive ions and establish an ion current flow which is indicative of the concentration of the alkali metal atoms or alkali metal-containing particles, the combination of

an electrode arrangement comprising a single collector electrode and a plurality of heated filament electrodes adapted to be selectively activated in combination with the collector electrode to develop said ion current flow, only one of said heated filament electrodes being activated in combination with the collector electrode at any given time, said plurality of filament electrodes being disposed with respect to said collector electrode such that the ion current flow in response to the monitored gas environment is substantially identical regardless of which of the filament electrodes is selectively activated for operational combination with said collector electrode.

4,095,172

VEHICLE ANTENNA TESTER

William Strand, 747 Station Rd., Victoria, B. C., Canada (V9B 2S1)

Filed Feb. 9, 1977, Ser. No. 767,202
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **2 Claims**

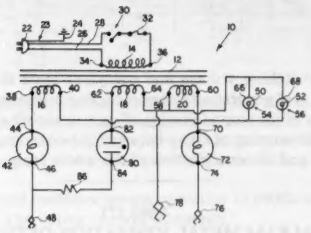
1. A vehicle antenna tester for checking the continuity of both the conductor and the shielding conductor of an antenna lead wire thereof and for checking the insulation between them

and for checking the electrical grounding of them to said vehicle comprising;

(a) three clamps, the first of said three clamps for coupling to said conductor, the second of said three clamps for coupling to said shielding conductor, the third of said three clamps for connection to the chassis of said vehicle,

(b) a pair of lamps, one terminal of one of said lamps coupled to said first clamp, one terminal of the other of said lamps coupled to said second clamp,

(c) a transformer, the primary winding of said transformer in a series electrical circuit with a manually operated operating switch and a fuse and a source of alternating current, the transformer having three secondary windings, each of said three windings terminating in a pair of terminals, one terminal of the first of said three secondary windings electrically coupled to the other terminal of said one of said lamps, one terminal of the second of said three secondary windings electrically coupled to the other terminal of said other of said lamps, one terminal of the third of said three secondary windings coupled electrically to the other terminal of said first winding,



(d) said third clamp electrically coupled to said one terminal of said third winding,

(e) a glow emitting discharge device, said discharge device having a pair of terminals, one of said discharge device terminals electrically coupled to the other terminal of said third winding, the other terminal of said discharge device electrically coupled to said second clamp, and

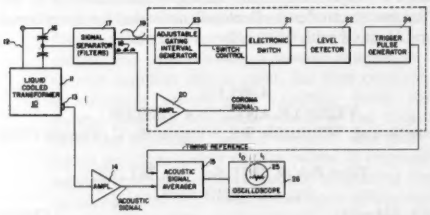
(f) at least one electrical receptacle, the receptacle having a pair of contacts for electrical connection with said lead wire, one of said contacts electrically coupled to said one terminal of said third winding, the other of said contacts electrically coupled to the other terminal of said second winding.

4,095,173

METHOD AND SYSTEM FOR CORONA SOURCE LOCATION BY ACOUSTIC SIGNAL DETECTION

Bernard Darrel, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,910
Int. Cl.[2] G01R *31/08, 31/06*
U.S. Cl. 324—52 **12 Claims**



7. A corona fault locating system for determining the location of one or more corona sources within the housing of encased electrical apparatus having a high potential conductor, said system comprising

an acoustic transducer mounted at a known position for sensing the acoustic vibrations within the housing including those produced by a corona discharge at the corona source and for generating an acoustic electrical signal representative of said acoustic vibrations,

filter means for filtering a voltage proportional to the voltage at said high potential conductor to derive an excitation frequency component signal and a radio frequency component corona signal caused by electrical disturbances accompanying corona discharge,

adjustable corona signal gating means for cyclically gating said corona signal to a level detector only during a preselected gating interval which has an adjustable delay with respect to a reference derived from said excitation frequency signal whereby various corona pulses can be selected for level detecting,

said level detector being operative to generate an output timing reference pulse upon detecting a predetermined corona signal amplitude occurring during the gating interval,

a signal averager to which said acoustic signal is fed continuously, said signal averager being repeatedly triggered by said timing reference pulse to repeatedly average said acoustic signal over a preset period and generate an averaged acoustic signal, and

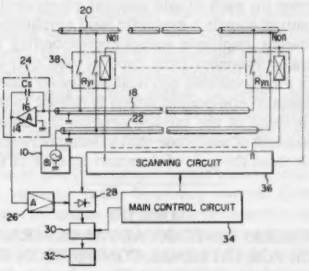
means for displaying said averaged acoustic signal to provide an indication of the distance from the known acoustic transducer position to the corona source.

4,095,174

SYSTEM FOR DETECTING LEAKAGE FAULTS IN A PIPELINE BY MEASURING THE DISTRIBUTED CAPACITANCE OF SECTIONS OF A SENSING CABLE BURIED PARALLEL TO SAID PIPELINE

Yasuhiro Ishido, Sayama, Japan, assignor to Towa Electric Co., Ltd., Japan

Filed Jan. 18, 1977, Ser. No. 760,223
Claims priority, application Japan, Jan. 22, 1976, 51-005482
Int. Cl.[2] G01R *31/08, 27/26;* **G01M** *3/04*
U.S. Cl. 324—52 **4 Claims**



1. A system for detecting leakage in an elongated pipeline comprising:

(a) a sensing elongated coaxial cable (20) with inner and outer conductors divided into a plurality of sections of substantially equal electrical characteristics and arranged in substantial geometric parallel with the pipeline wherein there is a variation in the distributed capacity of said inner and outer conductors upon penetration by an oily substance, said variation serving to sense leakage of oily substance from the pipeline;

(b) an input cable (18) and an oscillator cable (22) arranged substantially along said coaxial cable, switching circuits (38) connected to each of said sections, said switching circuits connecting said input and oscillator cables (18, 22)

to the inner and outer conductors, respectively of said coaxial cable;

(c) an input measuring circuit (24) connected to said input cable (18);

(d) an oscillator (10) connected to said oscillator cable (22); and,

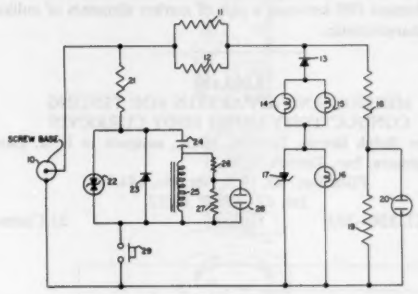
(e) scanning means (34, 36) electrically coupled to said switching circuits for scanning the switching circuits and causing all the sections of said coaxial cable to be scanned in sequence, to thereby connect the sensing coaxial cable through said input cable to said input measuring circuit thereby successively measuring the distributed capacity of the sections of said coaxial cable by means of a signal given from said oscillator cable.

4,095,175

ARC DISCHARGE LAMP BALLAST TESTER

Fredrick W. Paget, Rockport, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 24, 1977, Ser. No. 780,737
Int. Cl.[2] G01R 27/00
U.S. Cl. 324—57 R 5 Claims



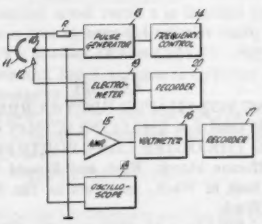
1. An arc discharge lamp ballast tester comprising first circuit means for detecting steady DC current in the output of the ballast, second circuit means for determining if the peak voltage output of the ballast is greater than about 400 volts, third circuit means for detecting third harmonics in the output voltage of the ballast, and means to connect the tester to an arc discharge lamp ballast.

4,095,176

METHOD AND APPARATUS FOR EVALUATING CORROSION PROTECTION

Jean Pierre Maes, Oostakker, and Alan Molyneux, Mariakerke, both of Belgium, assignors to s.a Texaco Belgium n.v., Brussels, Belgium

Filed Oct. 6, 1976, Ser. No. 730,054
Int. Cl.[2] G01R 27/02
U.S. Cl. 324—65 CR 11 Claims



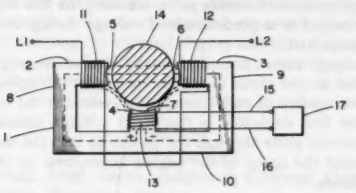
1. A method of evaluating corrosion protection afforded to a metallic surface by a surface layer thereon, wherein said metallic surface is contacted by a corrosive fluid, comprising the steps of establishing a circuit path through a working electrode and an inert electrode in the corrosive fluid, causing a pulsed current not exceeding 100 micro-amps and of predetermined frequency not less than 100 Hz to flow in said circuit path, and measuring the response of said circuit path to the said current flow to determine the solution resistivity and the double-layer capacitance at the interface between said working electrode and the corrosive fluid.

4,095,177

TRANSDUCER

Geoffrey John Harris, Burton, England, assignor to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 613,827, Sep. 16, 1975, abandoned, which is a continuation of Ser. No. 471,411, May 20, 1974, abandoned. This application Dec. 3, 1976, Ser. No. 747,468
Claims priority, application United Kingdom, May 29, 1973, 25587/73
Int. Cl.[2] G01P 3/46; H02K 17/42
U.S. Cl. 324—164 3 Claims



1. An electromagnetic sensing assembly for detecting the rotation of a metal shaft having a uniform arcuate surface of any one of a plurality of different diameters and rotatable about an axis coaxial with said surface, the improvement comprising:

an E shaped ferrous stator defining a pair of spaced outer poles and an intermediate pole with each outer pole having an outer free end in closely spaced relationship to the outer free end of the intermediate pole, each pole having an end surface with the end surface of each outer pole spaced from the end surface of each other outer pole by a distance substantially less than said different diameters,

means for adjustably spacing the end surfaces of said poles adjacent said uniform arcuate surface with the angular spacing between the end surface of said intermediate pole and each end surface of said outer poles subtending an arc of said uniform arcuate surface substantially less than 90° and spaced a substantially uniform small distance from said surface,

a generating coil on each of said outer legs, means for connecting each generating coil in series with each other generating coil to a common source of alternating current to generate a respective magnetic field in series aiding relationship with each field extending through a respective portion of said shaft between the free end of each outer pole and the free end of said intermediate pole,

and a detecting coil on said intermediate pole for detecting an alternating current voltage proportional to the velocity of rotation of said shaft in response to rotation of said shaft and the presence of each said respective magnetic field.

4,095,178

TACHOMETER CIRCUIT

Fenwick R. McLeod, Jr., Prospect Heights, Ill., assignor to Sun Electric Corporation, Chicago, Ill.

Filed Oct. 21, 1976, Ser. No. 734,646
Int. Cl.[2] G01R 13/42
U.S. Cl. 324—169 6 Claims

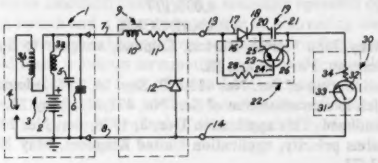
1. A tachometer for displaying the speed of an engine includ-

ing an ignition circuit for producing ignition pulses containing oscillations comprising in combination:

pulse-forming means for removing at least some of the oscillations from the ignition pulses to form corresponding timing pulses;

meter means for displaying the speed of the engine in response to the timing pulses;

a first capacitor connected in series with the meter means, said capacitor having a first plate and a second plate for accumulating charge;



rectifier means for enabling the transmission of a current pulse through the first capacitor and meter means in response to each timing pulse, whereby the first capacitor is charged to a predetermined voltage during each timing pulse; and

discharge means for momentarily interconnecting the first and second plates of the first capacitor in response to the termination of each timing pulse, whereby the voltage on the first capacitor is dissipated without transmitting a current pulse through the meter, so that the meter indicates the speed of the engine in response to the timing pulses.

4,095,179

LOCATING SYSTEM TO DETERMINE THE POSITION OF MOVABLE BODIES WITH RESPECT TO A REFERENCE

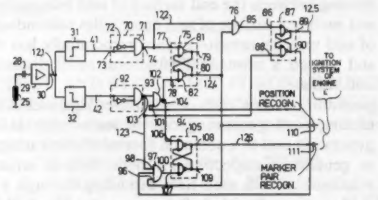
Wolfgang Bremer, Oberweier; Frieder Heintz, Blankenloch-Buchig; Ulrich Flaig, Markgroningen; Uwe Kiencke, Ludwigsburg, and Wolfram Glauert, Bamberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 13, 1975, Ser. No. 604,228

Claims priority, application Germany, Aug. 29, 1974, 2441437; Sep. 27, 1974, 2446193

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—207 **14 Claims**



1. Locating system to determine the position of a movable body (**20, 65**) comprising

at least four marker elements (**21, 22; 66, 67; 68, 69**) coupled to move with the body, a stationary transducer means (**23**) responsive to the marker elements and providing output signals staggered in time as the marker elements pass by the transducer means, the marker elements, in combination with the transducer means, forming a wave signal source;

wherein two marker elements (**21, 22; 66, 67; 68, 69**) each have different characteristics from the other two and the four elements are sequentially arranged on the body in pairs, with the elements of each pair being spaced by a predetermined distance to define a predetermined distance range on the body, and with the elements of each pair having respectively different characteristics;

the transducer means (**23**), upon scanning individual marker elements of the pairs (**21** and **22**; **66** and **67**; **68** and **69**) providing wave signals of respectively different initial polarity;

means (**70**) to distinguish between specific pairs of marker elements on the body, said distinguishing means comprising an additional marker element (**70**) located between the marker elements of at least one of the pairs (**68, 69**) and having the characteristic of one of the markers thereof;

and logic means (**70, 92, 75; 87, 105, 76**) connected to the transducer means and having two output terminals (**110,111**), said logic means (a) providing a first output pulse (**12.6**) at a first output terminal representative of the time between the null passage of sequential wave signals of opposite initial polarity and (b) a second output pulse (**12.4**) at the second output terminal (**110**) indicative of the occurrence of two sequential wave signals of like initial polarity,

whereby presence of an output pulse at said second output terminal (**110**) will be indicative of said additional marker element (**70**) between a pair of marker elements of unlike characteristic.

4,095,180

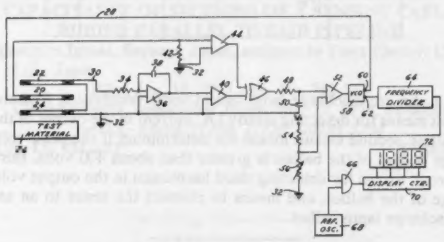
METHOD AND APPARATUS FOR TESTING CONDUCTIVITY USING EDDY CURRENTS

Gordon Ralph Brown, Livonia, Mich., assignor to K. J. Law Engineers, Inc., Detroit, Mich.

Filed Dec. 29, 1975, Ser. No. 644,809

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—233 **32 Claims**



24. Apparatus for measuring conductivity of a test material comprising means providing a periodic signal, means responsive to said periodic test signal to electromagnetically induce eddy currents in said test material, sensing means responsive to said eddy currents to develop a test signal as a function of said eddy currents, means for measuring the phase relationship between said periodic signal and said test signal, means for varying the frequency of said periodic signal until said phase relationship reaches a preselected specific level, means responsive to the period of said periodic signal to determine conductivity of the material as a direct linear function of said period when said phase relationship reaches said preselected level.

4,095,181

ROTATING POT SHAPED EDDY CURRENT PROBE IN WHICH ONLY A SMALL FRACTION OF THE LIP FORMING THE OUTER CORE PORTION IS RETAINED

Walter Jefferson Harris, Kent, and Ronald Murray Neufeld, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 17, 1976, Ser. No. 751,512

Int. Cl.[2] G01R *33/12*

U.S. Cl. 324—238 **3 Claims**

2. An eddy current probe for inspecting a workpiece having

a hole formed therein and having a fastener disposed therein for defects, said probe including the combination of:

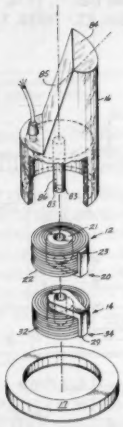
a first ferromagnetic pot core member in which only a small fraction of the lip forming the outer core portion is retained and **20** having a center cylindrical portion **21**;

a second ferromagnetic pot core member in which only a small fraction of the lip forming the outer core portion is retained and **34** having a center cylindrical portion **21**;

a first winding **22** circumferentially wound about said center cylindrical portion **21** of said first ferromagnetic pot core member **20**;

a second winding (**32**) circumferentially wound about said center cylindrical portion **21** of said second ferromagnetic pot core member **34**;

a cylindrically shaped optically clear probe housing **16** for maintaining said center cylindrical portions **21** in coaxial alignment;



said cylindrically shaped optically clear probe housing **16** having a portion of the top section angularly cut forming a flat viewing surface **84** and remaining top section cut off at a cooperating angle to that of the viewing surface forming a reflecting surface **85**, and said cylindrically shaped optically clear probe housing having an inner centrally located cylindrically shaped portion **86** extending through said center cylindrical portions **21** of said first and second pot core members **20**, **34**, said inner centrally located cylindrically shaped portion **86** having cross hairs **93** embedded in and crossing at the center bottom surface thereof so that said reflective surface provides reflection of cross hairs **83** to the eye of the operator viewing the centering of probe **10** over said fastener **86** through viewing surface **84**; and means permitting rotation of said outer lip portions through 360° once the latter is centered over said fastener.

4,095,182

DISPLAY DEVICE FOR TRANSCEIVER AND LIKE

Takao Kakigi, Kawasaki, Japan, assignor to Cybernet Electronic Corporation, Kanagawa, Japan

Filed Sep. 17, 1976, Ser. No. 724,173

Claims priority, application Japan, Oct. 8, 1975, 50/137843; Oct. 8, 1975, 50/137844

Int. Cl.[2] H04B *1/40*

U.S. Cl. 325—17 **6 Claims**

1. A display device for a transceiver and the like comprising:

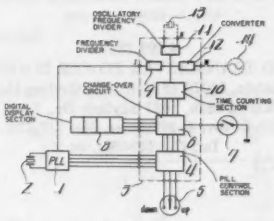
a phase-locked loop,

a pulse generating section,

a phase-locked loop control section for channel selecting connected to said phase-locked loop,

a time-counting section for time-counting connected to said pulse-generating section,

a change-over circuit connected to the phase-locked loop control section and to the time-counting section for selectively transmitting channel selecting signals received from said phase-locked loop control section and time counting signals received from said time-counting section,



an electronic display section connected to said change-over circuit and responsive to the channel selecting and the time-counting signals transmitted therefrom for selectively carrying out channel display and time display; and

a change-over switch for controlling the switching operation of said change-over circuit.

4,095,183

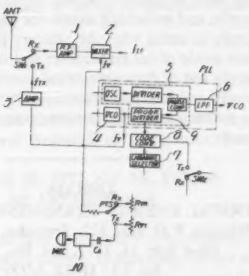
TUNING CIRCUIT

Takao Kakigi, Inagi, Japan, assignor to Cybernet Electronic Corporation, Kanagawa, Japan

Filed Jan. 25, 1977, Ser. No. 762,281

Int. Cl.[2] H04B *1/54*

U.S. Cl. 325—17 **3 Claims**



1. In a transmitter-receiver having a receiving circuit for converting a received carrier frequency into an intermediate frequency by mixing it with a local oscillation frequency which is the controlled output frequency of a voltage-controlled oscillator of a phase locked loop, and a transmitting circuit connected to said receiving circuit through a transmission-and-reception change-over switch; the improvement which comprises a tuning circuit having first and second variable-capacity elements provided in parallel with an oscillation inductor of said voltage-controlled oscillator, said first element receiving a DC voltage corresponding to said intermediate frequency and simultaneously receiving a DC voltage necessary for frequency modulation using transmitting audio signals while interlocking with the switching action of a press-to-talk switch for reception and transmission, said second variable-capacity element receiving voltages ranging within the controllable limits of said voltage-controlled oscillator from said phase locked loop so that the follow-up control of said phase locked loop may be achieved, and DC power supply means for said first variable-capacity element including a first and a second variable-resistance means, means for connecting said

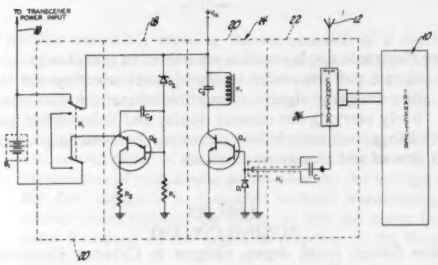
first variable-resistance means across the terminals of an external DC power supply, means for connecting said second variable-resistance means across the terminals of the external DC power supply, and a switching means for selectively applying divided voltages produced by said first and second variable-resistance means to said first variable capacity element according to the position of said press-to-talk switch, whereby frequency phase synchronization is achieved by one phase locked loop.

4,095,184

RADIO TRANSCEIVER POWER BOOSTER

Peter A. Hochstein, 14020 15 Mile Rd., Sterling Heights, Mich. 48077, and Kelvin Shih, 1481 Skylark Dr., Troy, Ohio 45373

Filed Nov. 1, 1976, Ser. No. 737,221
Int. Cl.² H04B *1/44*
U.S. Cl. 325—22 **10 Claims**



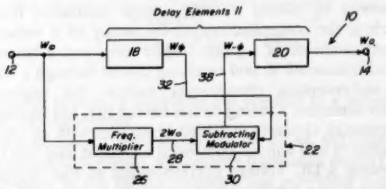
1. A transceiver assembly having a transmit mode and a receive mode for transmitting and receiving radio communication and comprising; a primary power supply, a secondary power supply which is rechargeable, recharging means for recharging said secondary power supply from the primary power supply, and switching means for placing said secondary power supply in series with the primary power supply during the transmit mode of the transceiver and taking said secondary power supply out of direct electrical contact with the primary power supply and into electrical contact with said recharging means for recharging said secondary power supply during the receive mode.

4,095,185

ELECTRICAL ENERGY TRANSMISSION NETWORK

Paul N. Winters, P.O. Box 327, Trumann, Ark. 72472

Filed Apr. 14, 1977, Ser. No. 787,373
Int. Cl.² H03K *5/159*
U.S. Cl. 328—55 **19 Claims**



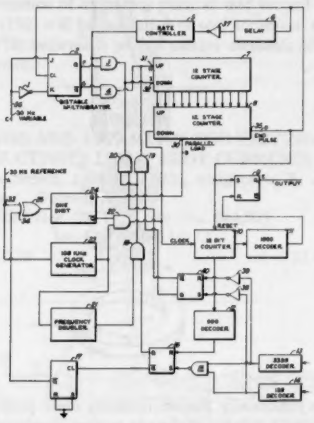
1. A method of maintaining a substantially constant phase relationship between transmitted energy at input and output terminals of an energy transmission network having energy storing delay elements producing a change in phase of the transmitted energy with respect to an input frequency thereof, including the steps of: dividing the energy storing delay elements into separate delay portions respectively producing changes in phase of the transmitted energy; passing the transmitted energy through said divided delay portions in sequence to phase shift the transmitted energy; doubling the input frequency of the transmitted energy at a reference phase angle; and subtracting the input frequency of the transmitted energy passed through only one of the divided delay portions from the doubled frequency at said reference phase angle to reverse the phase shift of the transmitted energy passed through said one of the divided delay portions, whereby the phase shift effected by the other of the divided portions of the delay elements produces a net change in phase substantially equal to zero.

4,095,186

VARIABLE PHASE SHIFTER

Andrew M. Vesel, Mount Arlington, N.J., assignor to The Cessna Aircraft Company, Wichita, Kans.

Division of Ser. No. 561,466, Mar. 24, 1975, Pat. No. 4,014,025.
This application Dec. 7, 1976, Ser. No. 748,340
Int. Cl.² H03K *5/13*
U.S. Cl. 328—133 **13 Claims**



1. A variable phase digital phase shifter for shifting the phase of an input signal comprising:
storage means for storing a signal indicative of the amount by which the phase of the input signal is to be shifted;
a source of clock pulses;
a first input signal terminal;
counting means connected to said first input signal terminal, to said storage means and to said clock pulse source and responsive to receipt of an input signal at said first input signal terminal for counting a number of pulses, from said clock pulse source, determined by the signal stored in said storage means;
output means coupled to said counting means for generating an output signal when said counting means has counted said number of pulses; and
adjusting means for adjusting the signal stored in said storage means to adjust the phase difference between the output signal and the input signal.

4,095,187

DEMODULATION SYSTEM FOR A MULTI-LEVEL MULTI-PHASE SUPERPOSITION-MODULATED CARRIER WAVE

Yasuharu Yoshida, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1977, Ser. No. 779,853
Claims priority, application Japan, Mar. 22, 1976, 51-31022
Int. Cl.² H03D *3/20*
U.S. Cl. 329—50 **3 Claims**

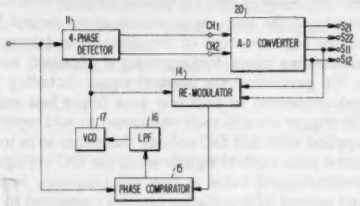
1. A demodulation system for demodulating into first and

second demodulated signals a multi-level, multi-phase, superposition-modulated carrier wave formed by combining first and second phase-modulated carrier waves synchronized with each other, comprising

an oscillator of a frequency controllable in response to a control signal,

a phase-detector circuit for detecting said superposition-modulated carrier wave with the output of said oscillator serving as a phase reference,

means for processing at least the output of said phase-detector circuit to produce said control signal,



a first demodulator circuit for discriminating the output of said phase-detector circuit to reproduce said first demodulated signal, and

a second demodulator circuit including squaring means for squaring the output of said phase-detector circuit, discriminator-shaper means for discriminating the output of said squaring means with respect to a given level, and logic means for obtaining the Exclusive-OR function of the output of said first demodulator circuit and the output of said discriminator-shaper means, whereby said second demodulated signal is reproduced.

4,095,188

CASCADED AMPLIFIER WITH FREQUENCY SENSITIVE COUPLING

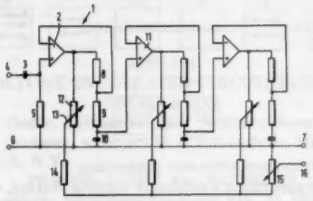
Robert Ronald Laupman, Wijchen, Netherlands, assignor to Novanex Automation N.V., Wijchen, Netherlands

Filed Aug. 31, 1977, Ser. No. 829,468

Claims priority, application Netherlands, Sep. 1, 1976, 7609730

Int. Cl.² H03F *1/36, 3/68*

U.S. Cl. 330—84 **1 Claim**



1. An amplifier having a plurality of cascaded stages each comprising an amplifying element, the output of each amplifying element being connected through a capacitor to a first output terminal of the amplifier, said capacitors being of increasing capacitance from the input stage of the final stage, characterized in that each amplifying element comprises an operational amplifier, the output of which is connected to said first output terminal through two series-connected resistors and the respective capacitor, the junction point of said two resistors being connected to the negative input of the operational amplifier, and the junction point of the capacitor and one of the series-connected resistors being connected to the positive input of a next operational amplifier, the output of each operational amplifier being additionally connected to the first output terminal through a variable resistor, the movable contact of which variable resistor is connected to the second output terminal of the amplifier.

4,095,189

ELECTRONIC POWER AMPLIFIER FOR DELIVERING A CONSTANT POWER INTO A LOAD IMPEDANCE

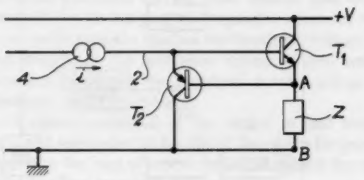
Paul Nguyen-Tan Tai, 56, rue des Pyrenees, 75020 Paris, France

Filed Feb. 7, 1977, Ser. No. 766,536

Claims priority, application France, Feb. 9, 1976, 76 03500

Int. Cl.² H03F *3/183*

U.S. Cl. 330—265 **6 Claims**



1. An electronic power amplifier for delivering into a load impedance a constant power which does not depend on variations in the value of said impedance, the level of said power being controlled by the value of an input current, wherein said amplifier comprises at least two transistors T_1 and T_2 of complementary type, the base of the first transistor T_1 being connected to a line for the supply of current delivered by a control current source, the emitter of said transistor T_1 being connected on the one hand to one end of the load impedance and on the other hand connected directly to the base of the second transistor T_2, the collector of said transistor T_1 being connected to a voltage supply of suitable polarity, the emitter of said transistor T_2 being connected to the current supply line and the collector of said transistor T_2 being connected to another end of the load impedance.

4,095,190

TUNING SYSTEM

Kazuyoshi Imazeki, and Koichi Kazami, both of Tokyo, Japan, assignors to General Research of Electronics, Inc., Tokyo, Japan

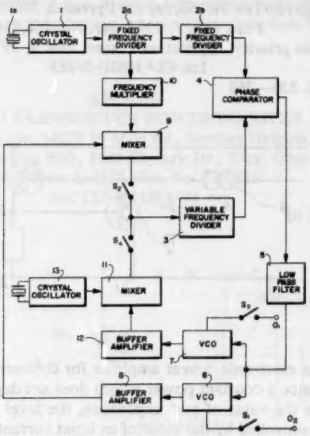
Filed Jul. 20, 1977, Ser. No. 817,366

Int. Cl.² H03B *3/04*

U.S. Cl. 331—2 **6 Claims**

1. A system for generating a plurality of preselected frequencies in a radio frequency device, comprising: means for generating a first reference signal having a predetermined frequency; means for generating a second reference signal having a predetermined frequency; means, including first and second controllable variable-frequency oscillators, first and second mixers, and a programmable frequency divider, for generating first and second output signals, with said first mixer being coupled to said first reference signal generating means and to said first variable-frequency oscillator to generate said first output signal having a frequency corresponding to the difference between the frequency of said first reference signal and the frequency of said first variable-frequency oscillator, and with said second mixer being coupled to said second reference signal generating means and to said second variable-frequency oscillator to generate said second output signal having a frequency corresponding to the difference between the frequency of said second reference signal and the frequency of said second variable-frequency oscillator; switch means; means coupled to said first reference signal generating means and selectively coupled to said first and second mixers by said switch means and said programmable frequency divider and selectively responsive to said first and second output signals for selectively comparing said first reference signal with said first output signal and said

first reference signal with said second output signal and developing a corresponding control signal which varies systematically in accordance with the frequency difference therebetween, with said control signal being applied to both said controllable variable-frequency oscillators to vary the oscillation frequencies thereof until the frequency of the selected



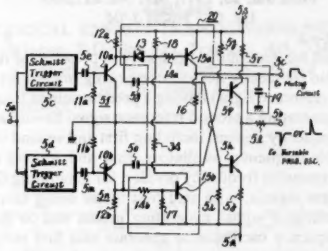
output signal is substantially equal to the predetermined frequency of said first reference signal, whereby the output signal of the corresponding controllable oscillator has a frequency which corresponds to one of the plurality of predetermined receiver frequencies as selected by both the programmable frequency divider and the mixer output signal selected by the switch.

4,095,191

PHASE LOCKED LOOP CIRCUIT

Michio Shibuya, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,024
Claims priority, application Japan, Feb. 16, 1976, 51-15702
Int. Cl.² H03B *3/04*
U.S. Cl. 331—4 **7 Claims**



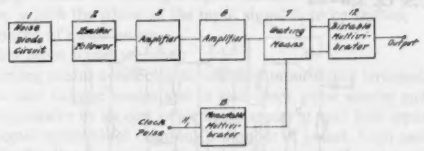
1. In a phase locked loop circuit having a variable frequency oscillator, a reference signal oscillator, a phase comparator supplied with output signals of said variable frequency oscillator and said reference signal oscillator, respectively, and detecting a phase difference therebetween to provide a corresponding output signal and a low pass filter supplied with said output signal of the phase comparator to provide a corresponding DC voltage for controlling the variable frequency oscillator so as to phase-lock the phase of said variable frequency oscillator into the phase of said reference signal oscillator, the frequency of said variable frequency oscillator being varied manually in such a way that the frequency of said variable frequency oscillator equals an integral multiple of the frequency of said reference signal oscillator; means for detecting said DC voltage from the low pass filter, circuit means for generating a control signal when said DC voltage exceeds a predetermined value, with said control signal having a polarity different from the polarity of said DC voltage from said low pass filter and with the amplitude of said control signal being larger than that of said DC voltage, means for combining said DC voltage and said control signal to provide a combined output signal, and means for controlling the frequency and phase of said variable frequency oscillator in response to said combined output signal of said combining means in such a way that the frequency of said variable frequency oscillator is varied outside of the lock range of the phase locked loop and toward the capture range of the phase locked loop until the next succeeding phase locking state is obtained: said circuit means for generating the control signal including an input terminal connected to said low pass filter; first and second Schmitt trigger circuits each connected to said input terminal and supplied with said DC voltage therefrom so as to produce respective pulse control signals when the DC voltage exceeds said predetermined value in opposite polarities, respectively; first and second differentiating circuits connected to said first and second Schmitt trigger circuits and producing respective output signals; first and second inverting amplifiers for receiving the output signals from said first and second differentiating circuits and producing respective phase inverted output signals; third and fourth differentiating circuits connected to said first and second inverting amplifiers, respectively, and producing spike-like pulse signals at the front and back edges of the respective phase inverted output signals; and a transistor switching circuit supplied with said spike-like pulse signals from said third and fourth differentiating circuits so as to generate said control signal.

4,095,192

RANDOM STATE GENERATOR

Edward E. Atkinson, Arlington, Va., and William E. Queen, Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1968, Ser. No. 715,933
Int. Cl.² H03B *29/00*
U.S. Cl. 331—78 **4 Claims**



1. A random state generator comprising:

means for generating a randomly varying voltage, said voltage having positive- and negative-going variations;

gating means for controlling the flow therethrough of said positive- and negative-going variations, including a transformer having a primary winding with two ends, a secondary winding with two ends, and a secondary center tap connection, said primary winding ends being connected to said randomly varying voltage means and said center tap connection being connected to said actuating means;

a capacitor for tuning said transformer to a desired bandpass frequency and filtering a power spectrum generated by the randomly varying voltage means connecting said two said secondary winding ends, for minimizing distortion of said randomly varying voltage signal and yielding a ramdom gaussian distribution output across said secondary winding of the transformer; and

two diodes each having an anode and a cathode, each anode

being connected to one of said two secondary winding ends, each cathode being connected to said state generating means;

actuating means for opening and closing said gating means; and

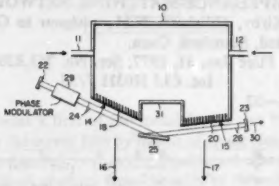
means connected to the output of said gating means, having two stable states, and controlled by said positive- and negative-going variations for generating one of said two states.

4,095,193

BROADBAND GAS LASER

George L. Clark, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 22, 1976, Ser. No. 651,493
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—94.5 G **4 Claims**



1. A broadband gas laser of the type having supersonic flow of the lasing gases, said laser comprising:

(a) a supply of lasing gases;

(b) means for creating a population inversion in the lasing gases;

(c) a plurality of nozzles through which the lasing gases issue, each of said nozzles having a face, said faces being aligned substantially along a straight line, and each of said nozzles having a central axis defining substantially the direction of flow of the gases; and

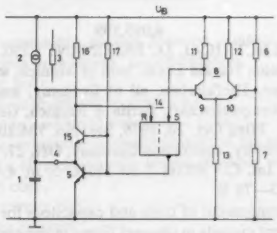
(d) means providing an optical cavity and for causing a lasing beam to propagate adjacent to the faces of said nozzles, said nozzles being so disposed and arranged that the direction of flow of the gases forms a predetermined acute angle substantially less than 90° with the laser beam, whereby the doppler distribution of the laser frequency is shifted by an amount depending on said predetermined angle.

4,095,194

MONOLITHIC INTEGRATED CIRCUIT FOR AN RC OSCILLATOR

Wolfgang Hoehn, Kirchzarten, and Wolfgang Sauer, Freiburg, both of Germany, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,177
Claims priority, application Germany, Feb. 27, 1976, 2608026
Int. Cl.[2] H03K *3/26*
U.S. Cl. 331—108 D **6 Claims**



1. A monolithic integrated circuit for an RC oscillator whose capacitor is charged and discharged between two voltage values corresponding to the maximum and minimum oscillator voltage when one terminal of said capacitor is coupled to ground and the other terminal of such capacitor is coupled to a terminal of said integrated circuit and, via a current source, to the live terminal of a source of supply voltage comprising:

a switching stage having a threshold corresponding to the maximum oscillator voltage, said switching stage having an input connected to the other terminal of the capacitor and an output that provides a signal when an input signal at least equals the threshold;

a switching transistor having base, emitter and collector terminals for discharging said capacitor when the voltage across said capacitor reaches the threshold voltage of said switching stage, the saturation voltage of said switching transistor serving as the threshold corresponding to the minimum oscillator voltage;

control means connected to the output of said switching stage and responsive to the signal therefrom for providing a signal to the base of said switching transistor for turning said switching transistor on; and

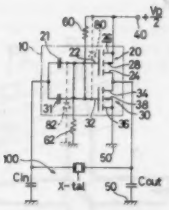
means responsive to the saturation voltage of said switching transistor for providing an inhibit signal to said control means, said control means being responsive to the inhibit signal for removing the signal from the base of the switching transistor, thereby allowing said capacitor to be charged.

4,095,195

LOW POWER DISSIPATION CRYSTAL OSCILLATOR

Takahito Saito, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Mar. 25, 1977, Ser. No. 781,497
Int. Cl.[2] H03B *5/36*
U.S. Cl. 331—116 R **12 Claims**



1. A low power dissipation crystal oscillator comprising:

an inverter circuit including a P-channel insulated gate field-effect transistor and a N-channel insulated gate field-effect transistor connected in series,

a single power supply connected to said inverter circuit,

an excitation circuit connected between an output and an input of said inverter circuit, said excitation circuit comprising a crystal resonator and a pair of capacitive loads connected between ground and an input and an output of said crystal resonator, respectively,

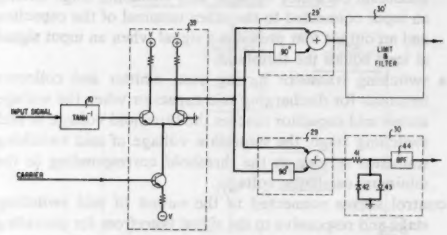
means for applying different DC bias potentials to the gates of said field-effect transistors, respectively,

said means comprising a first resistor of high resistance value connecting the power supply to the gate of said N-channel insulated gate field-effect transistor, and a second resistor of high resistance value connecting the gate of said P-channel insulated field-effect transistor to ground.

4,095,196
ARC-COSINE PHASE MODULATORS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 20, 1977, Ser. No. 817,352
Int. Cl.[2] H03C 3/00
U.S. Cl. 332—16 T 10 Claims



1. A phase modulator responsive to an input signal and to a carrier signal comprising:

first means for developing a signal proportional to the inverse hyperbolic tangent of said input signal;

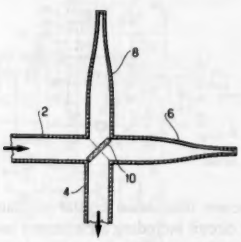
second means, responsive to said first means and to said carrier signal for generating a signal which is proportional to a sum of two signals that are exponentially related to the output signal of said first means and which is amplitude modulated with said carrier signal; and

third means for hard limiting the output signal of said second means.

4,095,197
PROPAGATION TIME EQUALIZER FOR CIRCULAR WAVE GUIDES

Gerard Le Coz, St Cheron, and Jean-Noel Marchalot, St Michel sur Orge, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed Feb. 3, 1977, Ser. No. 765,331
Claims priority, application France, Feb. 3, 1976, 76 02921
Int. Cl.[2] H01P 1/20; H03H 7/14
U.S. Cl. 333—28 R 3 Claims



1. A delay equalizer for a circular wave guide comprising:

a circular input wave guide;

a circular output wave guide having the same diameter as the input wave guide and being connected to the input wave guide by a common end with the axes of these two wave guides meeting at an angle;

a first progressive reflector constituted by a circular wave guide whose input diameter is equal to that of the input wave guide and the output wave guide and whose cross-section decreases from its input so that the waves which enter the first progressive reflector will be reflected after having travelled along a path which is longer for increasing frequency, said first progressive reflector being placed in the line of the input wave guide beyond said common end and being connected thereto by its input;

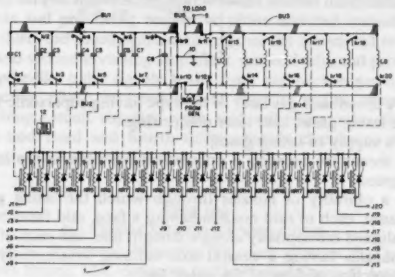
a second progressive reflector identical to the first reflector and placed in the line of the output wave guide beyond said common end and being connected thereto by its input; and

a plane semi-reflecting plate of the "quarter wave" type occupying the interior cross-section of said wave guides at their common end and being disposed so that the axis of the input wave guide will be symmetrical to the axis of the output wave guide in relation to this plate, the material and the thickness of this plate being chosen so that it passes half the energy of the waves which it receives with a phase shift of a quarter of a wavelength and reflects the other half of this energy.

4,095,198
IMPEDANCE-MATCHING NETWORK

Thomas J. Kirby, Hillsboro, N.H., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 31, 1977, Ser. No. 763,820
Int. Cl.[2] H03H 7/38
U.S. Cl. 333—32 13 Claims



1. An impedance-matching network for impedance-matching a source and a load, comprising:

a first pair of busses;

a second pair of busses;

a first plurality of reactive elements;

a second plurality of reactive elements;

first control means operative selectively to connect one or more of the first plurality of reactive elements across the first pair of busses thereby to achieve an effective first reactance across the first pair of busses, and operative selectively to connect one or more of the second plurality of reactive elements across the second pair of busses thereby to achieve an effective second reactance across the second pair of busses; and

second control means operative to interconnect the source and load with the first and second pairs of busses having the effective reactances thereacross in any one of a plurality of different possible circuit configurations.

4,095,199
ELECTRICAL LC RESONANT CIRCUIT

Reinhard Behn; Harald Loebl, both of Munich, and Karl-Heinz Preissinger, Taufkirchen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

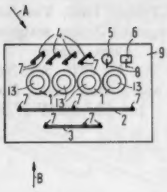
Filed Oct. 20, 1976, Ser. No. 734,101
Claims priority, application Germany, Oct. 27, 1975, 2548059
Int. Cl.[2] H03H 7/10; H01G 5/36, 4/34
U.S. Cl. 333—70 R 12 Claims

1. An arrangement of coils and capacitors for narrow tolerance resonant circuits in channel filters in the carrier frequency technology within the frequency range of between approximately 10 and 100 kHz, comprising:

(a) a mounting plate carrying and connecting the coils and capacitors;

(b) at least one fixed-tuned coil whose inductance is set in a fixed non-adjustable manner, said coil having a magnetic core and at least one wire winding;

(c) at least one self-healing laser trimmable capacitor comprising a flat stack of at least two metal layers which are separated by a dielectric layer and which are covered by a laser light permeable non-destructing cover film, at least two connecting wires contacting with the metal layers, the self-healing capacitor being oriented towards an edge of the base plate with respect to the fixed-tuned coil so



that at least a first of the metal layers can be burned off through the cover film by means of an incident laser beam, said fixed-tuned coil being positioned inwardly of the self-healing capacitor from the edge of the mounting plate, said laser-trimmable capacitor cover film being substantially undamaged when the capacitor is trimmed by a laser beam; and

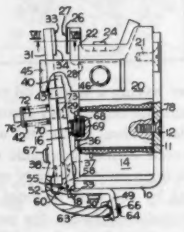
(d) a narrow-tolerance channel-filter resonant circuit being formed which includes said fixed-tuned coil and self-healing capacitor and has a resonant frequency within the frequency range of approximately 10 to 100 kHz, any additional coils forming the resonant circuit being fixed tuned and non-adjustable.

4,095,200

CONTACTOR HAVING REDUCED CONTACT BOUNCE AND SHORTER ARC TIME

Paul M. Gallatin, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1976, Ser. No. 753,310
Int. Cl.[2] H01H *3/60*
U.S. Cl. 335—193 **8 Claims**



1. A DC contactor having reduced contact bounce and shorter arc time comprising, in combination,

a magnetic yoke,

a magnetic core affixed to said yoke,

an energizing coil surrounding said core,

a magnetic armature pivotally mounted on said yoke and forming a closed magnetic circuit together with said yoke and said core,

a contact carrier bar,

a stationary contact,

a movable contact affixed to said contact carrier bar and cooperating with said stationary contact,

return spring means for resiliently urging said armature to open position,

said contact carrier bar being carried on said armature so that they move together during armature closing until said movable and stationary contacts engage and being pivotable relative to said armature during further travel of said armature,

pre-loaded contact pressure spring means for urging said contact carrier bar toward said armature, and

stop means in interfering relation with said contact carrier bar for limiting opening movement of said armature,

said contactor having a generally hyperbolic magnetic pull characteristic plotting magnetic pull on said armature versus magnet gap between said armature and said core for a given excitation of said coil, the magnet gap between said armature and said core when said stationary and movable contacts engage being less than the magnet gap therebetween at the knee of said hyperbolic characteristic,

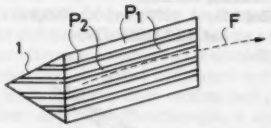
said contact pressure spring being pre-loaded to a force greater than said magnetic pull on said armature at the knee of said characteristic.

4,095,201

DEVICE FOR THE MAGNETIC CORRECTION OF THE TRAJECTORIES OF A BEAM OF ACCELERATED PARTICLES EMERGING FROM A CYCLOTRON

Jacques Kervizic, and Bernard Hurt, both of Paris, France, assignors to C.G.R. MeV, Paris, France

Filed Aug. 5, 1976, Ser. No. 711,801
Claims priority, application France, Aug. 8, 1975, 75 24803
Int. Cl.[2] H01F *7/00*
U.S. Cl. 335—210 **9 Claims**



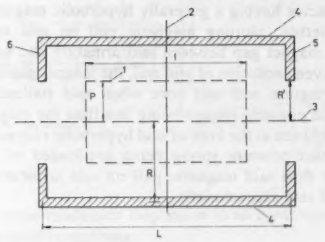
1. A magnetic correcting device for correcting the trajectories of a beam of accelerated charged particles emerging from an accelerator of cyclotron type, said cyclotron being associated with an electromagnet having two parallel circular polepieces between which said particles are accelerated, said cyclotron being provided with a peripheral extractive electrode for extracting said particles from said cyclotron, said device, which is designed for modifying the mean path of said particle beam emerging from said cyclotron and for focusing said emergent beam, being located at the periphery of said polepieces in the neighborhood of said extractive electrode, said device comprising at least a block of magnetic material having a predetermined shape, said block being constituted by a laminated composite magnetic material formed by a stack of plates made of materials having different permeabilities, said plates being arranged in planes which make predetermined angles in relation to the plane of the mean paths of said beam.

4,095,202

COIL FOR PRODUCING A HOMOGENEOUS MAGNETIC FIELD IN A CYLINDRICAL SPACE

Nils Allan Danielsson, Sollentuna, Sweden, and Karl-Peter Christian Lindblom, Nagu, Finland, assignors to Applied Research Laboratories S.A., Ecublens, Switzerland

Filed Nov. 14, 1975, Ser. No. 631,876
Claims priority, application Finland, Dec. 20, 1974, 3738/74
Int. Cl.² H01F 5/00
U.S. Cl. 335—213 4 Claims



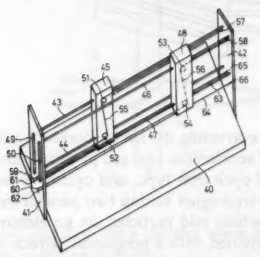
1. Coil for producing in a substantially cylindrical space a homogeneous magnetic field in a direction parallel to the axis of said cylindrical space, comprising at least one substantially cylindrical winding concentric with said cylindrical space, having a length exceeding that of said cylindrical space and having a substantially constant winding density over its longitudinal extension, said coil further comprising at least one pair of mutually identical windings disposed symmetrically with reference to a plane perpendicular to the longitudinal axis of said cylindrical winding through the centre thereof, extending in planes substantially perpendicular to the longitudinal axis of said cylindrical winding inwardly therefrom to a minimum radius being larger than the radius of said cylindrical space, and having a substantially constant winding density over their radial extension.

4,095,203

ARRANGEMENT FOR OBTAINING AN ELECTRICAL SIGNAL PROPORTIONAL TO A DISTANCE

Wolfgang Lesche, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 4, 1977, Ser. No. 793,502
Int. Cl.² H01F 21/04
U.S. Cl. 336—20 10 Claims



1. An arrangement for deriving an electrical signal corresponding to a distance comprising:

a conductor loop adapted to be arranged in a magnetic a-c field with its plane transverse to said field, said loop having first and second ends and first and second conductor sections extending from said first and second ends to a first fixed member;

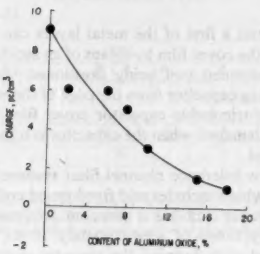
and a movable adjusting means whose movement is related to said distance, said adjusting means being arranged so that a first conductor portion of said first conductor section extends from its respective end of said loop to said adjusting means and a second conductor portion of said first conductor section extends from said adjusting means to said fixed point, and said adjusting means including means for deflecting said first conductor section so as to offset said second conductor portion from said first conductor portion.

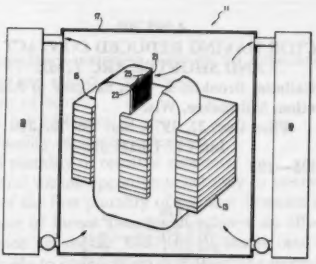
4,095,204

TRANSFORMER HAVING FORCED OIL COOLING SYSTEM

Teruo Miyamoto; Toshiji Ishii; Yoshikazu Miura, and Tohei Nitta, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1976, Ser. No. 649,271
Claims priority, application Japan, Jan. 27, 1975, 50-11708
Int. Cl.² H01F 27/12
U.S. Cl. 336—57 11 Claims





1. In a transformer having a forced oil cooling system, in combination, an insulating oil forcibly movable in the transformer, and an insulating sheet in contact with the insulating oil and partially covered with an inorganic material, the inorganic material producing a static charge of opposite polarity to the charge produced by the base material of the insulating sheet when relative motion between the insulating sheet and the insulating oil takes place due to forced flow of the insulating oil.

4,095,205

TRANSFORMER WITH IMPROVED INSULATOR

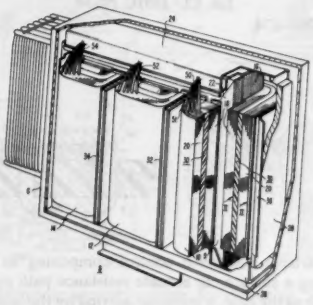
Stephen M. Schroeder, and George P. Michel, both of South Boston, Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 28, 1977, Ser. No. 819,804
Int. Cl.² H01C 27/32
U.S. Cl. 336—92 13 Claims

1. Electrical apparatus comprising:

an enclosure;

an electrical winding disposed within said enclosure and adapted for connection to an electrical potential;
a dielectric fluid disposed within said enclosure; and
solid insulating means for electrically insulating at least a portion of said electrical winding;
said solid insulating means including a first layer of a paper



consisting essentially of a fibrous web formed of wholly aromatic polyamide fibers, a second layer of a polyethylene terephthalate film having a thickness greater than 0.005 inches disposed in registry with said first layer and a third layer of a paper consisting essentially of a fibrous web formed of wholly aromatic polyamide fibers disposed in registry with said second layer.

4,095,206

ENCAPSULATED TRANSFORMER ASSEMBLY

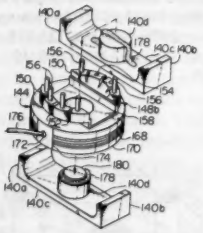
Hideo Hishiki, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Feb. 9, 1976, Ser. No. 656,702

Claims priority, application Japan, Feb. 10, 1975, 50-17103; Apr. 4, 1975, 50-40399; Feb. 10, 1975, 50-18977[U]; Feb. 10, 1975, 50-18978[U]

Int. Cl.² H01F *27/02, 27/30*

U.S. Cl. 336—96 **10 Claims**



1. A transformer assembly comprising a ferromagnetic core structure comprising two generally E-shaped core sections each consisting of a pair of spaced parallel arm portions, an intermediate portion integrally joining said arm portions together and a cylindrical land portion projecting from said intermediate portion substantially in parallel with said arm portions and located intermediate between said arm portions, said core sections being held together with the end faces of the arm portions of one of the core sections respectively in contact with the end faces of the arm portions of the other core section, the respective land portions of the two core sections having end faces which are spaced apart from each other to define a gap therebetween, primary and secondary coil units each including at least one winding arranged in layers and having at least two lead wires, the primary coil unit comprising a bobbin including a tubular portion having open axial ends and a plurality of radial portions projecting radially outwardly from one of said open axial ends and circumferentially spaced apart from each other to define gaps therebetween, each of said radial portions having connected thereto a terminal element projecting axially outwardly from each radial portion, the winding of the primar coil unit being mounted on said tubular portion and concentrically supporting the secondary coil unit thereon, each of said lead wires except for a high-voltage lead wire for the secondary coil unit being connected to each of the terminal elements on said radial portions through each of said gaps, said primary and secondary coil units being mounted on said core structure substantially in concentric relationship to said land portions of said core sections with said land portions received in said tubular portion of said bobbin, and a unitary void-free insulating envelope of a heat-resistant, elastic dielectric material impregnating the interstices between the turns and layers of the windings of said coil units, totally encapsulating the coil units and filling all the spaces between said core structure and said coil units with leading end portions of said lead wires projecting outwardly from said envelope.

4,095,207

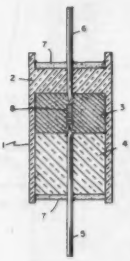
THERMAL FUSE

Warren H. Hay, Hamilton; Stephen F. Kimball, Georgetown, and Roy C. Martin, Salem, all of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Sep. 18, 1975, Ser. No. 614,564

Int. Cl.² H01H *85/04*

U.S. Cl. 337—20 **2 Claims**



1. A thermally responsive electric switch comprising an elongated cylindrical body having an integral intermediate section at one end thereof, said section having a small diameter axial hole therethrough; a cylindrical meltable pellet coaxially disposed within said elongated cylindrical body and bearing against said integral intermediate section, said pellet having a small diameter axial hole therethrough; a cylindrical plug coaxially disposed within, and closing off the other end of, said elongated cylindrical body and bearing against said pellet, said plug having a small diameter axial hole therethrough; a lead-in wire extending through the hole in said integral intermediate section and slightly into the hole in said pellet; another lead-in wire extending through the hole in said cylindrical plug and slightly into the hole in said pellet; and a pool of mercury filling the hole in said pellet and in contact with both lead-in wires so as to establish electrical continuity therebetween.

4,095,208

INTERMITTENTLY OPERABLE ELECTRICAL SWITCH ASSEMBLY

Maurice Harrold, Rowley Regis, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Oct. 20, 1976, Ser. No. 733,979

Claims priority, application United Kingdom, Nov. 8, 1975, 46304/75

Int. Cl.² H01H *61/06*

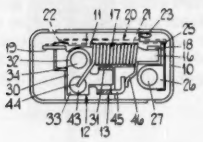
U.S. Cl. 337—125 **12 Claims**

1. An intermittently-operable electrical switch assembly

comprising an electrically insulating base having a pair of opposed surfaces; first, second and third electrical terminals mounted on said base in spaced relation and extending from one of said opposed surfaces thereof, said first, second and third electrical terminals being for respective connection to an electrical power supply, an electrical apparatus to be operated intermittently by said switch assembly, and at least one indicator lamp; an electrically conducting fixing element securing each of said first, second and third electrical terminals to said base, each said fixing element being electrically connected with its respective electrical terminal and extending through said base to the other of said opposed surfaces thereof;

a first support mounted on the said other surface of said base, said first support terminating at one end adjacent the fixing element for said second electrical terminal and at its other end adjacent the fixing element for said third electrical terminal; an electrical winding on said first support, said first support providing a core therefor, said electrical winding being disposed with its axis substantially parallel to said base; an armature mounted on said first support at the said one end thereof and extending substantially parallel to said electrical winding axis;

a first fixed electrical contact mounted on the said other surface of said base adjacent the said other end of the first support, said first fixed electrical contact being electrically connected to the fixing element for the third electrical terminal and being engageable by said armature, said armature normally being biassed away from said first fixed electrical contact but being engaged with said first fixed electrical contact when said electrical winding is energised in use;



a second support mounted on the said other surface of said base and including a portion upstanding from said base and a mounting flange integral therewith, said mounting flange extending in a direction transversely of said electrical winding axis and terminating at one end adjacent the fixing element for the second electrical terminal and at its other end adjacent the fixing element for the first electrical terminal, said second support being secured to said base by means of said mounting flange; a snap-action circuit breaker mounted on said upstanding portion of said second support;

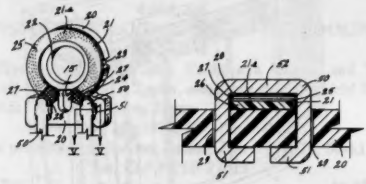
a second fixed electrical contact carried by the said other surface of said base and engageable with said circuit breaker; and a heat-expansible element normally biassing said circuit breaker into a first position and being arranged, when heated by an electric current passing therethrough in use, to release said circuit breaker to move into a second position, said circuit breaker engaging said second fixed electrical contact in one of its said first and second positions.

4,095,209

ELECTRICAL RESISTOR AND METHOD OF MAKING SAME

H. Eugene Wiswell, Elkhart, Ind., and Danny R. Hardwick, Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Apr. 29, 1976, Ser. No. 681,479
Int. Cl.[2] H01C *10/34*
U.S. Cl. 338—174 **9 Claims**



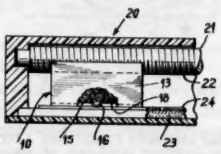
1. A variable resistance control comprising an apertured base having a surface, an arcuate resistance path provided on the surface of the base, a collector carried by the base in spaced relationship to the resistance path, a knob rotatably supported relative to the base, a first skirt extending from the knob and slideably engaging the base and spacing the knob from the base, a contactor constrained to rotate with the knob, the contactor wipably engaging and electrically connecting the collector and the resistance path intermediate the ends thereof, and a second skirt integral with one of the knob and the base and disposed outwardly from the first skirt and extending towards the periphery of the other of the knob and the base, the peripheral portions of the knob and the base and the outer surface of the first skirt defining an annular channel, the second skirt radially enclosing the annular channel.

4,095,210

HELICAL COIL SPRING WIPER POTENTIOMETER CONTACT DEVICE

Randall C. Ragan, Rancho Santa Fe, Calif., assignor to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 642,328, Dec. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,130, Mar. 18, 1974, Pat. No. 3,964,011. This application Sep. 16, 1976, Ser. No. 723,931
Int. Cl.[2] H01C *10/40*
U.S. Cl. 338—180 **4 Claims**



1. A potentiometer contact device comprising:

a contact body of electrically insulative material containing a cavity in one side thereof;

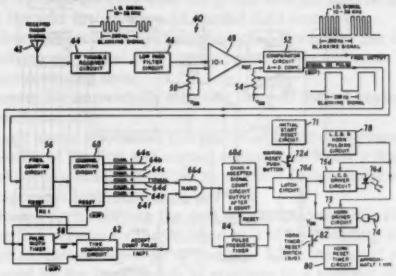
a helical coil spring wiper bound in said cavity by adhesive means for restraining rotation of said wiper relative to said contact body so that at least an arcuate portion of said coil wiper extends beyond said one side of said contact body; and

engagement means on said contact body for enabling said contact body to be moved along a resistance element with said arcuate portion of said coil wiper making uniform electrical contact therewith for providing minimal contact resistance variation during such movement.

4,095,211
CODED ELECTRONIC SECURITY SYSTEM

Frank J. Shaughnessy, Hartford, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Jul. 31, 1975, Ser. No. 600,935
Int. Cl.[2] G08B *1/08*
U.S. Cl. 340—224 4 Claims



1. An electronic security system for detecting, identifying and reporting the occurrence of alarm activating events at remote locations, comprising:

a plurality of transmitters, each located at one of said remote locations and each for transmitting a signal comprising a plurality of transmissions at a selected transmission repetition frequency and with a selected transmission duration less than the interval between said transmissions, said frequency and duration being common to all transmitters in the system, each of said transmissions comprising a series of pulses of RF energy at a selected identical pulse repetition frequency, said pulse repetition frequency being unique to each transmitter in the system;

a plurality of transmitter activating means, one for each of said transmitters, each for activating its corresponding transmitter for a selected time period on the occurrence of a particular alarm activating event;

a receiver, responsive to said transmitted signal, including separate means for comparing said transmission repetition frequency and transmission duration to selected values, thereby to verify the authenticity of said signal as one originating in one of said transmitters, counting means for measuring said pulse repetition frequency, thereby to determine which of said transmitters originated said signal, and means for providing an output signal representative of the occurrence of an alarm activating event at one of said transmitters if said signal is verified as authentic and determined to have a pulse repetition frequency corresponding to one of said transmitters;

and indicator means, responsive to said receiver output signal, for indicating the occurence of an alarm activating event.

4,095,212
REMOTE ELECTRIC STATE TESTER

Billy Paul Pruitt, 3511 La Prada, Mesquite, Tex. 75150

Filed Jun. 27, 1977, Ser. No. 810,498
Int. Cl.[2] G08B *1/08*
U.S. Cl. 340—224 7 Claims

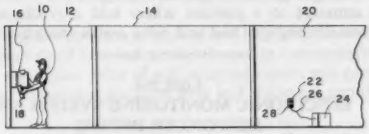
1. A remote live circuit tester for determining the condition of a circuit to be tested comprising, in combination:

a transmitter with an input and an output responsive to the receipt of an electrical signal at the input, the output having two states, one state corresponding to power on in the circuit and one state corresponding to power off in the circuit,

means for electrically connecting the circuit to be tested to the input of the transmitter,

a receiver responsive to the output states transmitted from the transmitter, and

an indicator responsive to the states received by the receiver

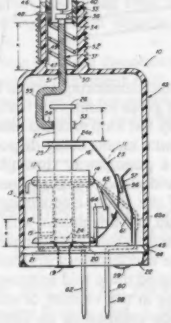


whereby the state of the indicator indicates the condition of the circuit to be tested.

4,095,213
MECHANICALLY ACTUABLE CONTROL RELAY

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 7, 1977, Ser. No. 757,523
Int. Cl.[2] G08B *21/00*; H01H *1/12, 51/06*
U.S. Cl. 340—252 R 7 Claims



1. A control relay comprising an insulate base, an electrically nonconductive coil form part joined to said base and having an axially extending bore formed therein, a relay coil wound about the external surface of said coil form part, a fixed core part disposed about said coil form part, said fixed core part having an opening therethrough in registration with said bore and being magnetizable responsive to electrical energization of said coil, a removable core part in the form of a plunger slidably seated in said opening in said fixed core part and said bore in said coil form part, said plunger having a radial shoulder proximate one end thereof normally located in spaced superposed relationship to said fixed core part, the end of said plunger remote from its end proximate said shoulder being normally disposed in said bore in said coil form part proximate but gapped from the end of said bore proximate said base, a spring metal armature having two ends, one of which is fixed to said coil form part proximate said base and the other end of which is fixed to said shoulder, a movable relay contact carried by said armature, a fixed contact fastened to said base and rising therefrom to a position where it is engageable by said movable contact responsive to downward movement of said plunger in said coil form part to substantially close the gap between the said end of said plunger remote from said shoulder and the end of said bore proximate said base, at least a pair of current carrying terminals fixed to said base, one of said terminals being electrically connected to one end of said relay coil

and the other of said terminals being electrically connected to said fixed contact and the other end of said relay coil, a relay housing joined to said base, and a mechanical actuator mounted on said housing and operably connected to said plunger at said shoulder, said actuator being operable to depress said plunger into said coil form part and thereby move said armature to a position where said movable and fixed contacts are engaged and said relay coil is energized.

4,095,214

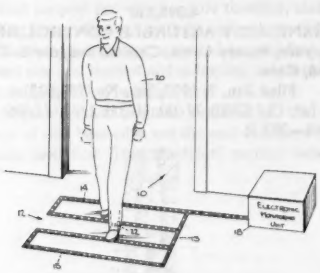
ELECTRONIC MONITORING SYSTEM AND RESPONDER DEVICE

Arthur J. Minasy, Woodbury, N.Y., assignor to Knogo Corporation, Hicksville, N.Y.

Filed Jun. 17, 1976, Ser. No. 697,128

Int. Cl.[2] G08B *13/00*; G01D *21/04*

U.S. Cl. 340—258 C **3 Claims**



1. An electronic monitoring system for detecting the passage of objects past a given monitoring station, said system comprising an essentially flat loop antenna means which lies in a single plane, said antenna means being disposed at the surface of the floor adjacent a passageway through said given monitoring station so that said plane of said antenna is substantially parallel to the plane of the floor, electromagnetic monitoring means connected to said antenna means, said monitoring means being operable to energize said antenna means in a predetermined frequency range and to detect predetermined electromagnetic responses produced upon said antenna means when a resonant circuit is present in the vicinity of said antenna means, and a responder device comprising an elongated bar of ferromagnetic material, an insulated electrically conductive wire coiled about said bar, a capacitor connected to the ends of said wire to form a resonant circuit and means mounting said bar, wire and capacitor on the leg of an object whose movement is to be monitored, said mounting means comprising a casing which holds said bar, said coil and said capacitor and a fastening element for holding said casing to the leg of said object, said fastening element being oriented with respect to said casing such that the longitudinal axis of said bar is maintained substantially perpendicular to said plane of said loop antenna means, whereby said predetermined electromagnetic responses cause a signal change in said antenna which change is detected by said monitoring means.

4,095,215

PAGER SUBSYSTEMS

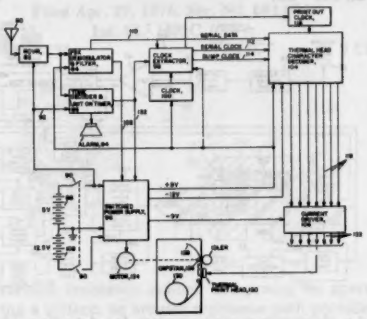
Thomas J. Mortimer, Amherst, N.H., assignor to Sanders Associates, Inc., South Nashua, N.H.

Division of Ser. No. 580,092, May 22, 1975, Pat. No. 4,028,661. This application Mar. 10, 1977, Ser. No. 776,405

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—311 **14 Claims**

1. In a low-power drain paging unit for receiving predetermined sequential tone-coded address signals followed by multitone FSK message signals and for printing out the message after decoding of the address signals which includes battery operated means for receiving said signals, for decoding a predetermined address and for actuating normally quiescent electrical apparatus of said pager in response thereto, said normally quiescent electrical apparatus being battery powered and including means for decoding the FSK message and means for displaying the decoded message, the improvement wherein



said FSK message decoding means including means for producing a signal indicative of said FSK message by detecting only one of the tones of said FSK signal, whereby said one tone FSK decoding means contributes to reduce batter drain and extend the life of the pager.

4,095,216

METHOD AND APPARATUS FOR DISPLAYING ALPHANUMERIC DATA

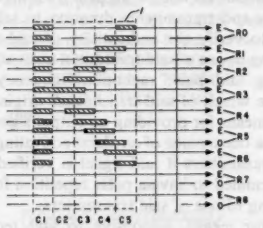
Denis Frank Spicer, Bedford, England, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 26, 1976, Ser. No. 708,524

Claims priority, application United Kingdom, Aug. 7, 1975, 33014/75

Int. Cl.[2] G06K *15/20*

U.S. Cl. 340—324 AD **10 Claims**



1. Apparatus for generating video signals suitable to produce an alphanumeric display on a display panel by deflection of an energetic beam over the panel in an interlaced raster having first and second field scans, the apparatus including:

(a) digital storage means having a plurality of storage locations respectively allocated to different alphanumeric characters to be displayed, there being at each storage location a plurality of groups of storage elements storing data representing the particular character allocated to the location in a rectangular dot matrix form, each group of storage elements storing the dot pattern for a particular row of the matrix;

(b) first address means for selecting a storage location of the digital storage means in accordance with a character to be displayed;

(c) second address means for selecting at a series of instants in a particular order the groups of storage elements at the location selected by the first address means and producing

corresponding first output data signals from the groups of storage elements, and also for selecting between the instants of the series the groups of storage elements in the same order to produce second output data signals from the groups of storage elements and such that a group selected between instants is associated with a group selected at the next preceding or the next succeeding instant depending on whether the data from the group selected is to be used in the said first or the said second field scan;

(d) first and second registers connected to receive the first and second output data signals respectively and store the corresponding data;

(e) means for sequentially selecting the data in both registers synchronously;

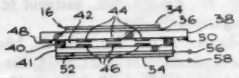
(f) logic means responsive to a pair of adjacent data elements in each of the first and second registers to detect a diagonal portion of said character to produce a control signal in response to said detection; and

(g) means for modifying the data selected sequentially from the first register by the addition to it of (1) a leading edge dot elongation signal in response to a control signal produced by the logic means in response to a positive slope diagonal during a said first scan and in response to a negative slope diagonal during a said second scan and (2) a trailing edge dot elongation signal in response to a control signal produced by the logic means in response to a positive slope diagonal during a said second scan and in response to a negative slope diagonal during a said first scan, said modified data forming the video signal.

4,095,217
COMBINED LIQUID CRYSTAL DISPLAY AND PHOTOVOLTAIC CONVERTER

Hirotsugu Tani; Kyoji Taguchi, and Shigeru Arita, all of 251 E. Victoria Ave., Carson, Calif. 90746

Filed Mar. 7, 1977, Ser. No. 775,261
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 R **10 Claims**



1. A combination liquid crystal display and electrical generator, including:

a liquid crystal chamber having a first and a second transparent wall and containing liquid crystal material;

first transparent electrodes of a predetermined shape carried by said first transparent wall;

second transparent electrodes of a predetermined shape carried by said second transparent wall and juxtaposed to said first transparent electrodes; and,

combination light reflector and photovoltaic conversion means positioned along said second transparent wall in line with the lightpath through, sequentially, said first transparent wall, said liquid crystal material and said second transparent wall.

4,095,218
HYBRID PULSE WIDTH-PULSE RATE DIGITAL-TO-ANALOG CONVERTER METHOD AND APPARATUS

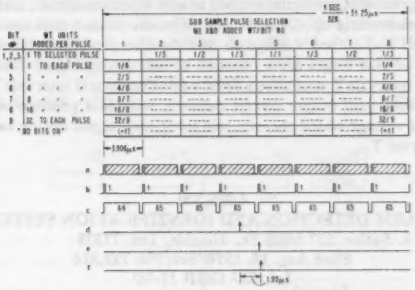
William George Crouse, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,728
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 DA **9 Claims**

1. In a digital-to-analog converter in which multi bit digital representations of instantaneously measured analog wave form voltages are received as inputs and from which it is desired to produce analog voltage outputs by controlling the total energy content of the output spectrum produced by an output voltage from a switched supply means, which waveform spectrum is applied to an integrator to reconstruct the desired analog waveform, the method of operating said converter comprising steps of:

allocating the total duration of a voltage output from said switched voltage supply into n discontinuous periods of time, each of said periods having at least a minimum duration; and

controlling the duration of each of said allocated discontinuous periods of time independently and in correspondence with the digital value of said received inputs, said periods being increased in duration over said minimum period by



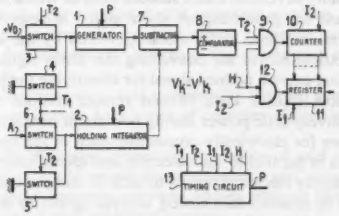
a number of said minimum sized increments the total number of said increments of increase being equal to the binary value of the totality of the high order bits contained in said multi bit digital input, said total incremental increase in duration being divided equally among said *n* discontinuous periods;

and also increasing certain of said n discontinuous periods of time by one said minimum increment each, the number of said periods so increased being in correspondence with the binary value of the individual low order bits of said multi bit digital input.

4,095,219
ARRANGEMENT FOR CODING WITH COMPRESSION THE ABSOLUTE VALUE OF AN ANALOG SIGNAL

Sylvain Fontanes, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 28, 1976, Ser. No. 727,538
Claims priority, application France, Oct. 2, 1975, 75 30233
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 NT **5 Claims**



1. An arrangement for coding with compression the absolute value of an analog signal, said arrangement comprising integrating means for integrating said analog signal during first periodic time intervals having a duration T_1 and referred to as intervals T_1 separated by second periodic time intervals having a duration T_2 and referred to as intervals T_2, and holding for the duration T_2 the integrated signal resulting from the integration of said analog signal during an interval T_1; means for generating in the course of each interval T_2 *n* ramp signals having a common absolute value, *n* being a positive integer; means for comparing during each interval T_2 the absolute value of the integrated signal obtained during the preceding interval T_1 with the absolute value of said ramp signals; means

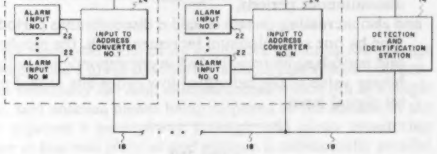
for generating clock pulses; and means for, in the course of each one of said second time intervals, counting said pulses for a duration determined by the instant when the absolute value of said n ramp signals is equal to the absolute value of the integrated signal, wherein, T_1 and T_2 being multiples of a common duration T, said integrating means comprise: at least one integrating charge transfer device having $(p+q)$ successive stages having identical weighting coefficients, with $p = T_1/T$ and $q = T_2/T$, an injection circuit coupled to the first of these stages, and an output circuit for delivering, with a possible constant voltage added thereto, a signal resulting from the integration of the signal applied to said injection circuit; means for alternately applying to said injection circuit said analog signal and a fixed voltage so that the charges injected in the first of said stages are a function of said analog signal during said intervals T_1 and have a fixed value during said intervals T_2, whereby said output circuit delivers, with said possible constant voltage added thereto, said integrated signal during each interval T_2.

4,095,220

ALARM DETECTION AND IDENTIFICATION SYSTEM

Joe A. Sadler, 327 Main St., Humble, Tex. 77338

Filed Aug. 18, 1976, Ser. No. 715,316
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—409 **9 Claims**


REMOTE SITE
ALARM INPUT NO. 1
ALARM INPUT NO. M
INPUT TO ADDRESS CONVERTER NO. 1
REMOTE SITE
ALARM INPUT NO. P
ALARM INPUT NO. Q
INPUT TO ADDRESS CONVERTER NO. N
DETECTION AND IDENTIFICATION STATION

1. An alarm detection and identification system comprising, in combination:

a detection and identification station including a source of electrical power and means for responding to a plurality of different analog current address signals to provide a distinctive indication of each of said signals to distinguish it from any of the other of said signals;

a plurality of remote alarm stations each of which includes a means for generating an alarm signal in response to an alarm condition and a means powered by the source of electrical power for converting the alarm signal into an analog current address signal for identifying the particular remote station, each of said remote stations requiring relatively little power during non-alarm periods; and

a means for electrically connecting each of the remote stations in parallel to the detection and identification station to supply electrical power to each of said remote stations, and to conduct said analog address signals to said detection and identification stations.

4,095,221

ELECTRICAL STORM FORECAST SYSTEM

Chester D. Slocum, Jr., 1811 SW. 98th Ave., Miami, Fla. 33165

Filed Mar. 29, 1976, Ser. No. 671,028
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—421 **6 Claims**

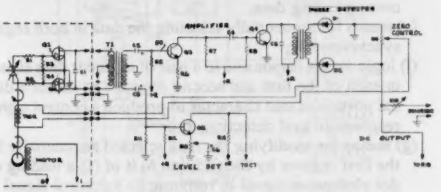
1. A storm forecast system including a sensor unit for receiving electrostatic field information, an amplitude and phase detector coupled to said sensor unit, and information processing means coupled to said amplitude phase detector, said system comprising:

(a) sensor board means (26) having two alternately conductive sections (A, B) radially disposed around a center;

(b) a rotor (22) with blades corresponding to said sections for rotation in a plane adjacent to said sensor board means;

(c) first and second resistors (R3, R4) in series with a center point, said resistors each having an outer end coupled to one of said sections;

(d) first and second field effect transistors (Q1, Q2) coupled to said first and second resistors, said field effect transistors each having an output side;



(e) a transformer (T1) with a center tapped primary and a secondary winding, said primary winding having two ends, one end each being connected to an output side;

(f) a rotating phase reference generator (28) coupled to said sensing board means (2*b*);

(g) a phase detector including first and second diodes (D1, D2);

(h) amplifier means coupling the output of said sensor unit to said phase detector; and,

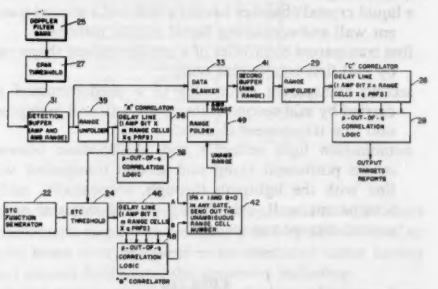
(i) recorder terminals for coupling a recorder to said phase detector.

4,095,222

POST-DETECTION STC IN A MEDIUM PRF PULSE DOPPLER RADAR

David H. Mooney, Jr., Arnold, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 665,138, Mar. 8, 1976, abandoned. This application May 27, 1976, Ser. No. 690,754
Int. Cl.[2] G01S *7/28, 9/02, 9/42*
U.S. Cl. 343—7 A **15 Claims**



12. A pulse doppler radar receiver for detecting the range of a target from received signals which include target returns, main beam clutter returns, area sidelobe clutter returns and discrete sidelobe clutter returns, said receiver comprising:

means for filtering the main beam clutter returns from said received signals;

means for providing an adaptive threshold signal which varies in response to the amplitude of the area sidelobe clutter returns said providing means being responsive to said filtering means to remove said area sidelobe clutter returns from said received signals;

means for unfolding the output of said providing means over a predetermined range, said unfolding means being re-

sponsive to the output of said providing means to provide an unambiguous range signal;

means for thresholding the unambiguous range signal in response to the output of said unfolding means, the threshold being such that the discrete sidelobe clutter returns are rejected over a selected range of said unambiguous range signal;

means for detecting discrete sidelobe clutter returns in the unambiguous range signal of said unfolding means said detecting means being responsive to said unfolding means and to said thresholding means to provide a blanking signal;

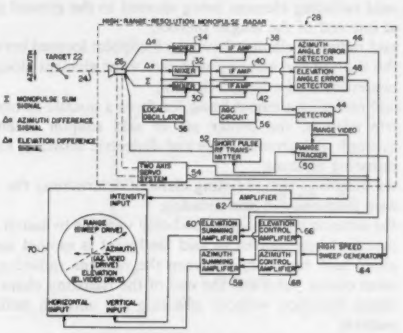
means for blanking the discrete sidelobe clutter returns detected by said detecting means from the output of said providing means, said blanking means being responsive to said detecting means to provide the target returns of the received signals; and

means for determining the range of the target in response to said target returns provided by said blanking means.

4,095,223
FOUR-DIMENSIONAL ISOMETRIC RADAR TARGET IMAGE DISPLAY

Dean D. Howard, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 8, 1977, Ser. No. 785,976
Int. Cl.² G01S 7/20
U.S. Cl. 343—7.9 **2 Claims**



1. In a target-indicating system including a high-range-resolution monopulse radar which produces a range trigger signal and elevation angle error data, azimuth angle error data and range video data from the echo signals received from a target, and further includes a display system having an *x-y* display with vertical, horizontal and intensity inputs for controlling a display trace, said range video data being provided to said intensity input, the improvement to said display system which comprises:

sweep generator means receiving said range trigger signal for generating a sweep voltage in response to said range trigger signal;

elevation summing amplifier means for receiving and summing said elevation angle error data and said sweep voltage generated by said sweep generator, the output of said elevation summing amplifier being fed to said vertical input of said display system for driving said display trace vertically and modulating said elevation angle error data on said display trace; and

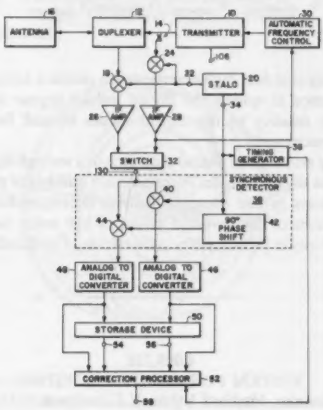
azimuth summing amplifier means for receiving and summing said azimuth error data and said sweep voltage generated by said sweep generator, the output of said azimuth summing amplifier being fed to said horizontal input of said display system for driving said display trace horizontally and modulating said azimuth angle error data on said display trace; and

said outputs of said azimuth and elevation summing amplifiers causing said display trace to be driven diagonally and generating an isometric presentation of said target data.

4,095,224
DIGITAL PHASE CORRECTION FOR COHERENT-ON-RECEIVE PULSED RADAR SYSTEM

Eric A. Dounce, Audubon, Pa., and Guy V. Morris, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 741,253, Nov. 12, 1976, abandoned, which is a continuation of Ser. No. 594,134, Jul. 7, 1975, abandoned. This application May 27, 1977, Ser. No. 801,124
Int. Cl.² G01S 7/40
U.S. Cl. 343—17.1 R **3 Claims**



1. In a pulsed radar system having transmitted signals, received signals and a reference signal, there being relative phase relationships therebetween, the phase relationships changing from each transmitted pulse to the next, the combination comprising:

free running oscillator means for generating the reference signal;

means for providing each relative phase relationship between the transmitted signal and the reference signal in the form of a complex digital reference number;

means for storing said complex digital reference number;

means for sequentially sampling the subsequent received signals;

means for converting said sequentially sampled subsequent received signals to a series of complex digital numbers; and

means for digitally correcting the phases of said series of complex digital numbers representing said sequentially sampled subsequent received signals, utilizng said stored complex digital reference number.

4,095,225
RANGE SIDE LOBE SUPPRESSION METHOD FOR A PHASE MODULATED RADAR PULSE

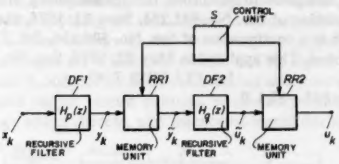
Erik Östen Erikmats, Vastra Frolunda, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 22, 1976, Ser. No. 743,777
Claims priority, application Sweden, Nov. 24, 1975, 7513178
Int. Cl.² G01S 7/28
U.S. Cl. 343—17.2 PC **2 Claims**

1. In a radar equipment, a method for eliminating unwanted range side lobes in a received radar pulse when compressing the pulse, said pulse when transmitted being coded according

to a certain code pattern and when received being converted to a sequence of digital values, said method comprising the steps of:

filtering the sequence of digital values in a first digital filter whose digital transfer function has a number of poles with positions in the complex z-plane all corresponding to the positions of the zeros of the z-transform defining the certain code pattern situated within the unity circle $|z| = 1$ whereby a first digital sequence is obtained;



reversing said first digital sequence to obtain a second digital sequence in which the digital values appear in reverse order relative to the digital values in said first digital sequence; and

filtering said second digital sequence in a second digital filter whose digital transfer function has a number of poles with positions in the complex z-plane corresponding to the positions of the inverted values of the zeros outside the unity circle $|z| = 1$ of the z-transform of said code pattern.

4,095,226

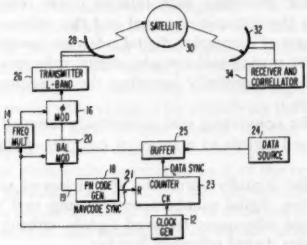
SYSTEM FOR COMMUNICATION

Dale L. Kratzer, Medford Lakes, N.J., assignor to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 389,796, Aug. 20, 1973, Pat. No. 4,004,237, which is a continuation-in-part of Ser. No. 33,748, May 1, 1970, Pat. No. 3,755,816. This application Feb. 23, 1976, Ser. No. 660,656

Int. Cl.² G01S *1/30*

U.S. Cl. 343—105 R **14 Claims**



2. A system for synchronized data communication by means of transmitted signals having synchronization and data portions, said system comprising the steps of:

generating local synchronizing signals and combining said synchronizing signals with the received synchronization portion;

controlling the phase of said synchronizing signals for adjustment in a direction to place said synchronizing signals in a certain phase relation with said received synchronization portion;

and synchronizing the detection of the received data portion signals with said adjusted synchronizing signals.

4,095,227

ASYMMETRICALLY FED MAGNETIC MICROSTRIP DIPOLE ANTENNA

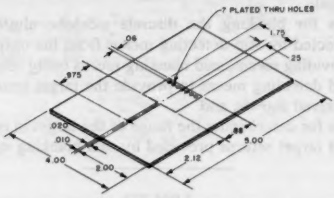
Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,695

The portion of the term of this patent subsequent to Jul. 27, 1993, has been disclaimed.

Int. Cl.² H01Q *1/38*

U.S. Cl. 343—700 MS **10 Claims**



1. An asymmetrically fed magnetic microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:

a. a thin ground plane conductor;

b. a thin rectangular radiating element spaced from said ground plane;

c. said radiating element being electrically separated from said ground plane by a dielectric substrate;

d. said radiating element being shorted to the ground plane at one end of the length thereof;

e. said radiating element having a feedpoint located between the shorted end and opposite end of the element along the centerline of the length thereof;

f. said radiating element being fed from a coaxial-to-microstrip adapter, the center pin of said adapter extending through said ground plane and dielectric substrate to said radiating element;

g. the length of said radiating element determining the resonant frequency of said antenna;

h. the antenna input impedance being variable to match most practical impedances as said feedpoint is moved moved along said centerline between the antenna radiating element center point and the end of the radiating element in either direction without affecting the antenna radiation pattern;

i. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, said spacing between the radiating element and the ground plane having somewhat greater effect on the bandwidth than the element width;

j. optimum match for the resonant mode of oscillation being obtained by varying the location of said feed point along the element edge.

4,095,228

WINDSHIELD ANTENNA DEFROSTER COMBINATION WITH RADIO INTERFERENCE REDUCTION

Hans Heinrich Meinke, Gauting; Heinz Lindenmeier, Planegg; Friedrich Landstorfer, Munich; Gerhard Flachenecker, Ottobrunn, and Jochen Hopf, Garching, all of Germany, assignors to Hans Kolbe & Co., Bad Salzdetfurth, Germany

Filed Nov. 18, 1976, Ser. No. 743,466

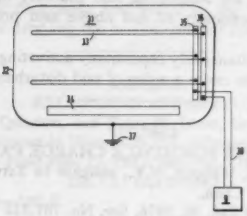
Claims priority, application Germany, Nov. 20, 1975, 2552049

Int. Cl.² H01Q *1/02, 1/32*

U.S. Cl. 343—704 **5 Claims**

1. In an automotive vehicle having a window and havng a vehicle body, in combination, a window heater comprising an arrangement of heating conductor sections provided on the window; and a radio receiving antenna located in the vicinity

of the heating conductor sections, the heating conductor sections being comprised of at least two heating conductor sections together forming a bifilar conductor section group, the two heating conductor sections of each bifilar conductor section group being arranged approximately parallel and closely spaced to each other, the heating conductor sections being so interconnected that the heating current flowing through one of the sections of each group also flows through the other section of the group but in the opposite direction.

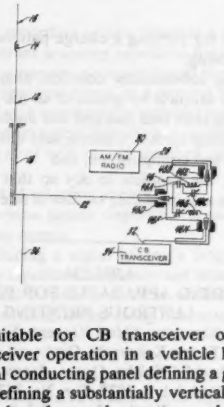


4,095,229

TRIBAND VEHICLE ANTENNA

James O. Elliott, Xenia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 22, 1977, Ser. No. 770,814
Int. Cl.[2] H01Q *1/32, 5/00*
U.S. Cl. 343—715 **3 Claims**



1. A system suitable for CB transceiver operation and AM/FM radio receiver operation in a vehicle having a substantially horizontal conducting panel defining a ground plane, including: means defining a substantially vertical well extending downwardly below the panel; an antenna element coaxial with said well and movable between a retracted position telescoped into the well and in operating position extending upwardly from the well, the antenna element in operating position having a lower conductor length above the panel, a loading coil extending above the first conductor length, and an upper conductor length extending above the loading coil, the whole having a length of the order of 3 feet; a splitter unit adapted to receive input connection from a transmission line and defining output connections adapted to be connected to the radio frequency input of an AM/FM radio or the like and the radio frequency input/output terminals of a CB transceiver unit, respectively; means defining a signal-carrying transmission line of substantially half wave electrical length in the FM band and connected from the input connections of the splitter unit and the antenna element, said transmission line having a relatively large characteristic impedance in relation to the attached input impedance of the splitter and therefore low capacity per unit length; means defining an open stub transmission line attached to said last transmission line adjacent the connection of the antenna element, said open stub transmission line exhibiting an inductive reactance in the FM frequency band offsetting the capacitive reactance of the antenna element so providing impedance in the FM band at the junction of the first transmission line and the antenna element substantially equal to the impedance of the input terminals of the radio receiver at FM frequencies, whereby the length of the open stub may be adjusted to provide impedance match in the FM frequencies without substantially affecting operation in the AM band or the CB band, and the length of the signal-carrying transmission line may be adjusted to provide proper impedance match for the CB frequency range.

4,095,230

HIGH ACCURACY BROADBAND ANTENNA SYSTEM

William E. Salmond, Fullerton, and Ronald L. Auletti, Alta Loma, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed Jun. 6, 1977, Ser. No. 803,710
Int. Cl.[2] H01Q *19/12, 1/36*
U.S. Cl. 343—729 **16 Claims**

1. An antenna system comprising,
a parabolic reflector dish having a dielectric substrate and a conductive material coating on the substrate,
antenna feed means positioned at the focus of said paraboloid and directed at the reflector dish for providing a narrow beam radiation pattern, and
means for coupling energy to and/or from the antenna feed means,
wherein the improvement comprises,
the conductive material coating on the reflector dish substrate defining a plurality of conductive spiral arms for providing a wide beam radiation pattern,
means defining a cavity for backing the conductive spiral arms, and
means for coupling energy to and/or from the conductive spiral arms on the reflector dish substrate,
whereby the parabolic reflector dish is operable as a primary antenna providing a wide beam radiation pattern.

4,095,231

BASE STATION ANTENNA

Larry D. Carter, Anderson, S.C., assignor to True Temper Corporation, Cleveland, Ohio

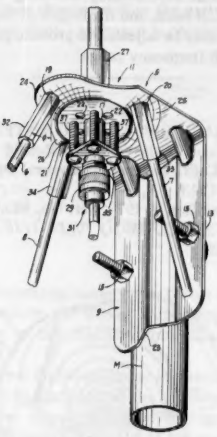
Filed Dec. 10, 1976, Ser. No. 749,714
Int. Cl.[2] H01Q *1/48, 9/34*
U.S. Cl. 343—846 **9 Claims**

1. A base station antenna comprising:
a bracket including a first section for attachment to an external support; and a second section transverse to said first section, said second section having top and bottom sides, a flattened central portion having a central opening for receiving the base portion of an upwardly extending first antenna whip, and a peripheral portion around the central portion and having a plurality of other openings spaced radially from said central opening for receiving the base

portions of a plurality of downwardly extending second antenna whips, said peripheral portion being inclined to render second antenna whips received in said other openings inclined downwardly and outwardly from a first antenna whip received in said central opening;

a first antenna whip having a base portion including means for mounting said first antenna whip in said central opening, said first antenna whip extending from the top side of said second section in an upward direction; and

a plurality of second antenna whips, each having a base portion including mounting means for mounting said second antenna whips in said other openings, said second antenna whips extending downwardly and outwardly from the bottom side of said second section.

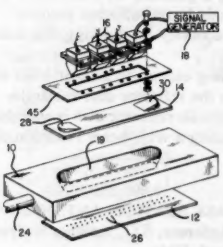


4,095,232

APPARATUS FOR PRODUCING MULTIPLE UNIFORM FLUID FILAMENTS AND DROPS

Charles L. Cha, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Jul. 18, 1977, Ser. No. 816,607
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **8 Claims**



1. Apparatus for producing a plurality of streams of fluid droplets, comprising:

reservoir means for containing a fluid under pressure;

orifice plate means forming a bottom portion of said reservoir means and having a plurality of orifices defined therein through which said fluid can be expelled from said reservoir means;

elongated pressure plate means forming a top portion of said reservoir means opposite said bottom portion;

a plurality of pressure plate stimulator means contacting a surface of said pressure plate means opposite another surface thereof which is in contact with said fluid in said reservoir, for bending said pressure plate means transverse to the longitudinal dimension of said pressure plate means so as to cause a uniform pressure disturbance in said fluid issuing from said plurality of orifices;

support means for supporting said plurality of stimulator means independently of and above said pressure plate means; and

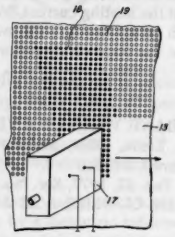
means for simultaneously repetitively activating said stimulator means to cause a series of said disturbances.

4,095,233

METHOD FOR FORMING A CHARGE PATTERN

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1976, Ser. No. 701,323
Int. Cl.[2] G01D *15/18*; G03G *15/00*
U.S. Cl. 346—75 **15 Claims**



1. A method for forming a charge pattern on an insulating surface, comprising:

(a) producing substantially colorless charged droplets and uncharged droplets by means of an ink jet apparatus;

(b) depositing both said charged and uncharged droplets on said insulating surface wherein said charged droplets are in a patterned configuration; and

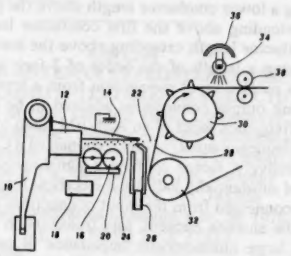
(c) allowing the droplets to dry so that a charge pattern remains on said insulating surface in said patterned configuration.

4,095,234

RECORDING APPARATUS FOR PROVIDING LUSTROUS PRINTING

Sanai Mito, Takarazuka; Shinji Kinpara; Yuji Sumitomo, both of Nara, and Toshio Kobayashi, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 5, 1977, Ser. No. 813,329
Claims priority, application Japan, Jul. 8, 1976, 51-81692
Int. Cl.[2] G01D *15/18*; B41M *5/00*
U.S. Cl. 346—75 **7 Claims**



1. In a recording apparatus which prints desired symbols on a record receiving member through the use of preferably col-

ored heat ray absorbing material, the improvement comprising:

a heat ray source for heating the record receiving member carrying the printed symbols thereon;

a roller impregnated with luster; and

means for depressing said roller to the record receiving member carrying the heated, printed symbols thereon.

4,095,235

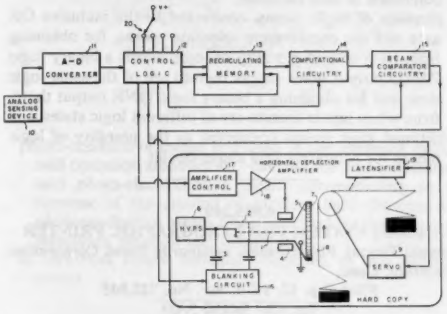
RECORDING APPARATUS

William T. Quarton, and Peter R. Lowe, both of Englewood, Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 22, 1977, Ser. No. 771,022

Int. Cl.[2] G01D *9/42*

U.S. Cl. 346—110 R **3 Claims**



1. In a graphic recording system wherein a scanning beam, operated at a constant scanning repetition frequency, is selectively unblanked in response to input signals to produce a trace representative of the input signal on a moving record member, means for providing a substantially constant trace intensity on said record member notwithstanding a selectively variable speed of movement of said record member, said means comprising:

a speed correlated selecting means,

a frequency division means responsive to said speed correlated selecting means,

means for producing a signal having a frequency equal to said scanning repetition frequency and being connected to an input of said frequency division means,

said frequency division means being operative to provide an output signal the frequency of which is a division of said scanning repetition frequency correlated to the selected speed of movement of said record member, and

enabling means responsive to said output signal to enable the unblanking of said scanning beam at a repetition frequency equal to said frequency of said output signal correlated with the selected speed of movement of said record member.

4,095,236

ELECTRONIC STENCIL ENGRAVING MACHINE STYLUS AND SUPPORT

Julio G. Tauszig, Buenos Aires, Argentina, assignor to A. B. Dick Company, Chicago, Ill.

Continuation of Ser. No. 611,821, Sep. 9, 1975, abandoned. This application Mar. 11, 1977, Ser. No. 776,594

Claims priority, application Argentina, Feb. 27, 1975, 257801

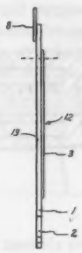
Int. Cl.[2] G01D *15/00*

U.S. Cl. 346—139 C **3 Claims**

1. A replaceable stylus support unit for use in an electronic engraving machine of the type wherein a stencil or the like is removably affixed to a rotatable drum and swept past an adjacent stylus, the machine being provided with a base member for receiving the stylus unit, a magnet mounted adjacent to the base member and means for selectively bending the unit onto the drum, the stylus support unit comprising

a first blade having a front end portion and a rear portion having an edge, which rear portion is made of a magnetic material, and which front portion has a stylus mounted thereon;

a second blade attached at one of its ends only to said first blade and positioned in an overlying and normally contacting relationship with respect thereto, the opposite end of said second blade being freely movable forward and



away from said first blade for dampening vibrations of said stylus by the friction created due to the movement of said second blade against said first blade;

whereby, said stylus support unit has its rear portion received by the base means and releasably captivated there by the magnet in a position overlaying the drum and may be bent into the drum by the means for selectively bending the unit, and whereby the stylus support unit may be selectively and easily removed and released from the stencil engraving machine by moving it away from the magnet.

4,095,237

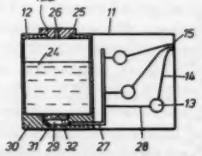
INK JET PRINTING HEAD

Jan Roger Amberntsson; Roger Ingemar Andersson, both of Angered, and Stig Bertil Sultan, Floda, all of Sweden, assignors to Aktiebolaget Electrolux, Sweden

Continuation of Ser. No. 536,553, Dec. 26, 1974, abandoned. This application Mar. 19, 1976, Ser. No. 668,301

Int. Cl.[2] G01D *15/16*

U.S. Cl. 346—140 R **5 Claims**



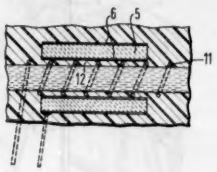
1. An ink jet printer having a movable printing head provided with a plurality of pumping chambers, said printing head being movable adjacent to a recording medium, an outlet channel for each of said pumping chambers terminating adjacent to said recording medium comprising a liquid reservoir moving and co-acting with said printing head, at least one conduit communicating with said reservoir with the respective pumping chambers, a housing mounting said movable printing head and associated liquid reservoir for simultaneous movement therewith, and a foamed material element located in the flow path of the liquid from said reservoir to said pumping chambers, said element being constituted of porous material, the pores of which form capillaries for said liquid and prevent the passage of air into said conduit.

4,095,238

PIEZOELECTRIC DRIVE ELEMENT FOR THE PRINTER HEADS USED IN INK-OPERATED MOSAIC PRINTER UNITS

Erich Kattner, Munich; Max Guntersdorfer, Zorneding, and Joachim Heinzl, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 17, 1976, Ser. No. 724,114
Claims priority, application Germany, Sep. 29, 1975, 2543420
Int. Cl.[2] G01D *15/16;* **B41J** *3/04*
U.S. Cl. 346—140 R **2 Claims**



1. A piezoelectric drive element for a printer head cast of a dielectric material for use in an ink mosaic printer device, the drive element cylindrically surrounding a passage for ink extending through the printer head and comprising:

a ceramic body having radially internal and external cylindric faces, the internal face being spaced from the ink in the ink passage;

a pair of electrodes, one on each of the internal and external cylindric faces of the ceramic body; and

a metal spiral bearing elastically upon the internal one of the electrodes, the spiral having axially-spaced turns and the cast dielectric material of the printer head filling spaces formed axially between said turns and radially between the ink passage and the internal electrode,

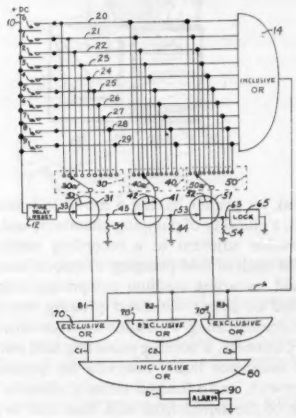
whereby said printing ink is ejected droplet fashion upon piezoelectric contraction of the ceramic body.

4,095,239

DIGITAL COMBINATION LOCK AND MEANS FOR REMOTELY PRESETTING COMBINATION THEREIN

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation of Ser. No. 578,991, May 19, 1975, abandoned. This application Jan. 31, 1977, Ser. No. 764,514
Int. Cl.[2] H04Q *3/02, 3/00*
U.S. Cl. 340—147 MD **14 Claims**



1. Digital combination locking means having an alarm circuit, comprising the combination:

a plurality of push buttons;

combination selection means electrically connected to the push buttons, each one of the combination selection means having capability of being preset to any one of 10 digit positions;

an inclusive OR gate, each of said push buttons being connected to the input of said inclusive OR gate and to said combination selection means;

a plurality of semiconductor switches serially interconnected directly to each other, electrically connected to each of the push buttons, said switches being sequentially activated during operative mode of said locking means when said push buttons are momentarily depressed in a preselected order determined by particular settings of the combination selection means;

lock means in series circuit with the last in sequence of activation of said switches;

a plurality of logic means, connected to the inclusive OR gate and the combination selection means, for obtaining from each of said plurality of logic means a binary logic ZERO output when inputs thereto are of the same logic state and for obtaining a binary logic ONE output therefrom when inputs thereto are of different logic states; and

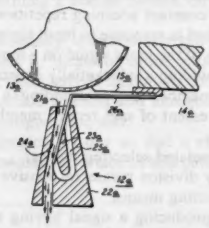
additional logic means connected to the plurality of logic means for activating said alarm circuit.

4,095,240

EXHAUST SYSTEM FOR PYROGRAPHIC PRINTER

Takayuki Tsutsui, Ebina, Japan, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1976, Ser. No. 722,945
Int. Cl.[2] B41M *5/00*
U.S. Cl. 346—163 **6 Claims**



1. In combination with a pyrographic printer having a stylus mounted for movement along a predetermined path to print an image on a recording medium, an exhaust system for collecting waste products released by said recording medium as the image is being printed; said exhaust system comprising

means for defining an elongated inlet opening substantially adjacent to and coextensive with the entire path of movement for said stylus;

means for establishing a non-uniform vacuum substantially entirely along said inlet opening, including means for maintaining a relatively strong portion of said vacuum in alignment with said stylus as said stylus moves along said path.

4,095,241

PHOTO-SENSING CIRCUIT

Seiichi Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 459,216, Apr. 8, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,460
Claims priority, application Japan, Apr. 11, 1973, 48-40999
Int. Cl.[2] G03B *7/08;* **G01J** *1/42*
U.S. Cl. 354—31 **7 Claims**

1. A circuit for detecting an amount of incident light, comprising;

an operational amplifier having a feedback path connected between its output and input terminals for amplifying an electrical input signal and producing an electrical output in response thereto;

photo-electromotive means connected between the input terminals of said operational amplifier for supplying said operational amplifier with the electrical input signal corresponding to the amount of incident light thereon;

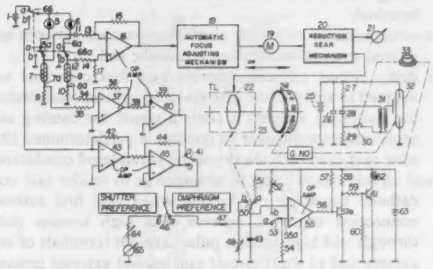


photo-conductive means provided in the feedback path of said operation amplifier for reducing the load resistance of said photo-electromotive means corresponding to the increase of the amount of incident light thereon, said photoconductive means being provided for expanding the measuring range of said circuit; and

an electrical output terminal connected to said amplifier means.

4,095,242

MATCHING DEVICE FOR FLASH LIGHT PHOTOGRAPHIC DEVICE

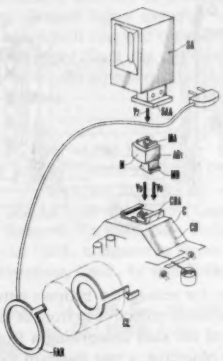
Tokuichi Tsunekawa; Masanori Uchidoi, both of Yokohama; Zenzo Nakamura, Urawa; Tetsuya Taguchi, Kawasaki; Hiroshi Aizawa, Machida, and Takashi Uchiyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 7, 1976, Ser. No. 748,155

Claims priority, application Japan, Dec. 12, 1975, 50-148967; Dec. 12, 1975, 50-148968

Int. Cl.² G03B *15/05*

U.S. Cl. 354—33 **7 Claims**



1. A matching apparatus mountable between a camera and a flash light device for the flash light device with at least a first terminal mounted on the flash light device for transferring a first signal including a diaphragm value signal and a charge completion signal and the camera with at least a second terminal mounted on the camera for receiving the diaphragm value signal and a third terminal mounted on the camera for receiving the charge completion signal comprising;

(a) a first matching terminal mounted on the matching apparatus to be connected to the first terminal for receiving the first signal from said first terminal,

(b) a control means for receiving the first signal through said first matching terminal so as to electrically separate the diaphragm value signal from the charge completion signal contained in the first signal, and

(c) a second and a third matching terminal connected to an output terminal of said control means for receiving the two signals separated by means of said control means, whereby said second matching terminal being connected to the second terminal for transferring the diaphragm value signal to the second terminal of said camera while said third matching terminal being connected to the third terminal for transferring the charge completion signal to the third terminal of said camera.

4,095,243

WARNING DEVICE FOR A CAMERA

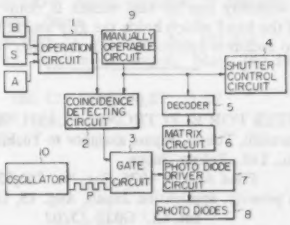
Saburo Numata, and Shin-ichiro Fujino, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Mar. 15, 1976, Ser. No. 667,071

Claims priority, application Japan, Mar. 19, 1975, 50-32305

Int. Cl.² G03B *7/00, 17/20*

U.S. Cl. 354—60 L **3 Claims**



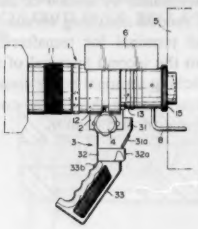
1. Warning device for a camera having an operation circuit for determining the proper exposure condition of exposure information such as the shutter time according to the informations of the brightness of the object, exposure information such as the diaphragm aperture of the objective and the film sensitivity, a manually operable circuit for manually setting the condition of the shutter time and an optical indicating circuit operated by the manually operable circuit for digitally indicating the condition of the shutter time set by said manually operable circuit, the improvement comprising: a coincidence detecting circuit with inputs connected to the output of the operation circuit and the manually operable circuit, respectively, a gate circuit, said coincidence detecting having an output connected to a first input of said gate circuit, and an oscillator with output connected to a second input of said gate circuit, the output of said gate circuit being connected to said optical indicating circuit, thereby causing blinking of the optical indication of said optical indicating circuit when the output of said manually operable circuit differs from that of said operation circuit, the optical indication of said optical indicating circuit being in a lighted state when the output of said manually operable circuit corresponding to the set shutter time coincides with the output of said operation circuit.

4,095,244

HANDY CAMERA WITH A GRIP

Tsuneo Yokoyama; Toshiyuki Yajima; Kazumichi Tsuchiya, and Hisao Takemae, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 26, 1976, Ser. No. 735,446
Claims priority, application Japan, Oct. 27, 1975, 50-129123
Int. Cl.[2] G03B *29/00*
U.S. Cl. 354—82 **11 Claims**



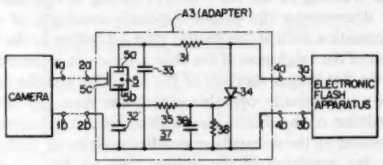
1. A handy type camera with a grip including a focal length varying means, a diaphragm aperture varying means, and a focus adjusting means, wherein at least one of said means is electrically controlled by use of a servomotor which is controlled by a potentiometer and at least one of the other two means is manually controlled by means of a manual control member provided on the camera, wherein the improvement comprises a grip extending obliquely downward and forward from the camera, a manually operable horizontally movable control member provided immediately above the portion of the grip which is held by a hand so as to be operated by the thumb of the hand, a movable member provided within the grip and connected or secured to said control member for moving the potentiometer within the grip by movement thereof, whereby one of said means is controlled with the thumb of the hand which holds the grip and at least one of the other two means is controlled with the other hand.

4,095,245

ADAPTER FOR ELECTRONIC FLASH APPARATUS

Kaoru Kuraishi, Tokyo, Japan, assignor to Toshiba Photo Products Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,539
Claims priority, application Japan, Aug. 15, 1975, 50-999376
Int. Cl.[2] G03B *15/02*
U.S. Cl. 354—141 **2 Claims**



1. In combination: an adapter and an electronic flash unit having a trigger circuit, said adapter comprising:

a pair of first external connection terminals detachably connected to high tension pulse take out terminals of a camera incorporating a high tension pulse generating means for generating the high tension pulse in response to the action of a shutter of said camera;

a pair of second external connection terminals detachably connected to a pair of external connection terminals of said trigger circuit,

and circuit means including at least a cold cathode thyratron having a control electrode directly connected to one of said first external connection terminals and a pair of main electrodes,

said cold cathode thyratron being connected across said second external connection terminals through a first capacitor;

a second capacitor connected in parallel with the series circuit of said cathode thyratron and said first capacitor, the junction between said first and second capacitors being connected to the other first external connection terminal;

a semiconductor switching element connected between said second external connection terminals; and

a delay circuit connected across said first capacitor and adapted to apply to the gate electrode of said semiconductor switching element a control signal for causing said semiconductor element to conduct a predetermined time after said cold cathode thyratron is rendered conductive,

said circuit means being so arranged as to render said cold cathode thyratron conductive when said first external connection terminals receive said high tension pulse through said high tension pulse take out terminals of said camera and to short circuit said second external connection terminals in response to said conduction of said cold cathode thyratron;

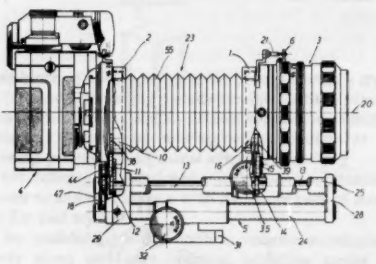
said electronic flash unit comprising a discharge lamp connected across a power supply and an energy storage capacitor charged by said power supply, and adapted to flash through discharge of said energy storage capacitor; and said trigger circuit being connected to receive said power supply voltage so as to permit said flash discharge lamp to be started when said pair of external connection terminals of said trigger circuit are short circuited.

4,095,246

BELLOWS SETTING EQUIPMENT

Ferdinand Kellner, Buxach 14, 8940 Memmingen, Germany

Filed Mar. 3, 1977, Ser. No. 774,021
Claims priority, application Germany, Mar. 27, 1976, 2613161
Int. Cl.[2] G03B *17/04*
U.S. Cl. 354—187 **10 Claims**



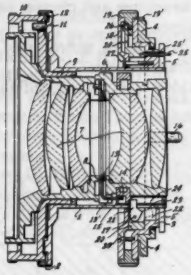
1. In equipment for setting the bellows between a camera and a relatively movable objective in front of said camera, this equipment being of the kind comprising a front standard for connection to the objective, a rear standard for connection to the camera, a guide frame on which said front and rear standards are mounted for relative adjustment to vary the spacing between them, and an assembly including a gear train associated with said standards and said guide frame for coupling diaphragm control elements associated respectively with the objective and with the camera, the improvement which consists in the provision of a member for coordinated operation of said control elements, said operating member acting on an intermediate element of said gear train.

4,095,247

INTERCHANGEABLE OBJECTIVE FOR CAMERAS

Heinz Rehn, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Nov. 30, 1976, Ser. No. 746,224
Claims priority, application Germany, Dec. 17, 1975, 2556771
Int. Cl.[2] G03B 7/20, 9/02, 17/00
U.S. Cl. 354—286 4 Claims



1. Interchangeable objective for a camera to provide diaphragm control, said objective comprising:

(a) an objective tube; a lens mounting being disposed in and axially movable in said objective tube;

(b) a lens or lens system and a diaphragm mounted in said lens mounting;

(c) a bayonet ring for connecting said objective tube to the camera, said objective tube being axially movably disposed in the bayonet ring for purposes of inserting the tube into the camera and pulling the tube out of the camera;

(d) releasable means for engaging said objective tube with the bayonet ring in a position ready for exposure after the tube has been pulled out of the camera and for disengaging the tube from the ring for pushing the tube into the ring and the camera;

(e) a diaphragm adjustment ring being rotatably mounted on said bayonet ring;

(f) a diaphragm control ring for transmitting the adjustment of said adjustment ring upon the diaphragm, said control ring being rotatably disposed on said lens mounting; and

(g) a coupling element being movably disposed on said diaphragm adjustment ring and capable of being engaged with and disengaged from the diaphragm control ring, respectively, when the objective tube has a pulled out and an inserted position.

4,095,248

REDUNDANCY REDUCTION SYSTEM FOR FACSIMILE TRANSCEIVERS

Carl R. Kolker, San Gabriel; John Scott Campbell, Pasadena, both of Calif.; Robert L. La Fond, New York, N.Y., and JaMi Smith, Monrovia, Calif., assignors to Faxon Communications Corporation, Pasadena, Calif., by said Kolker, Campbell and LaFond

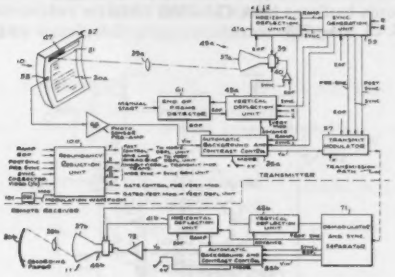
Filed Jun. 16, 1976, Ser. No. 696,744
Int. Cl.[2] H04N 3/34
U.S. Cl. 358—288 50 Claims

1. In a document scanning system employing a predetermined fast search velocity for searching the document and a predetermined slow scan velocity for reading the document, the method of performing a single wide area fast search pass for detecting presence of data anywhere in a wide band document area composed of a predetermined plurality of vertically successive narrow horizontal bands of predetermined width of the document, said method comprising the steps of:

(a) Directing at a selected one of the predetermined plurality of successive horizontal bands of the document, a narrow spot of radiation having a spot width approximating the width of a single narrow horizontal band of the document;

(b) Horizontally sweeping said spot of radiation across said document in a single fast search pass at a predetermined fast search velocity;

(c) During said single fast search pass, rapidly deflecting the spot of radiation up and down vertically across the predetermined plurality of successive narrow horizontal bands



to sweep the spot in a vertically reciprocating path across the predetermined plurality of successive horizontal bands;

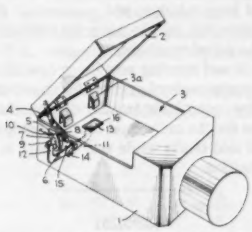
whereby the spot of radiation during the single wide fast search pass, narrowly illuminates any data in any of the predetermined plurality of successive horizontal bands of the document so as to detect the presence of such data in the wide band area.

4,095,249

FILM CARTRIDGE EJECTING DEVICE FOR A CAMERA

Jiro Miura, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed May 27, 1977, Ser. No. 801,334
Claims priority, application Japan, May 28, 1976, 51-69511[U]
Int. Cl.[2] G03B 17/02, 23/02
U.S. Cl. 354—288 13 Claims



1. A film cartridge ejecting device for use in a camera comprising:

means forming a cartridge chamber for receiving a film cartridge therein including side walls and a floor;

a movable lid member connected to one of said side walls for providing access to said cartridge chamber;

an ejecting means which is movable to a first position wherein said ejecting means projects into said cartridge chamber and a second position wherein said ejecting means is retracted out of said cartridge chamber;

a drive means for moving said ejecting means from said second position to said first position; and

an operating means movable in opposite directions with respect to the respective opening and closing of said lid member, said operating means being positioned to contact and operate said drive means when said lid member is

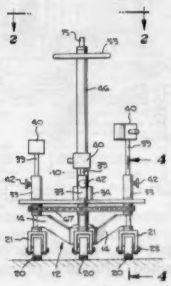
partly opened, but which is positioned out of contact with said drive means when said lid member is fully opened, and which contacts but does not operate said drive means when said lid member is closed.

4,095,250

STEERABLE CAMERA CARRIAGE

Frederick G. Giglioli, 400 S. Sunkist, Anaheim, Calif. 92806

Filed Apr. 19, 1976, Ser. No. 678,215
Int. Cl.[2] G03B *17/00*
U.S. Cl. 354—293 **7 Claims**



1. A steerable camera carriage comprising:
a base member having bearing openings at the corners thereof and a bearing opening intermediate the corners thereof;
an upright shaft journaled in each of said corner bearing openings for rotation about a vertical axis;
each of said shafts having a support wheel rotatably mounted on the lower end thereof and a wheel sprocket disposed thereon below said base member;
support means for individual camera equipment mounted on the upper end of each of said shafts so as to rotate therewith about the vertical axis thereof;
a steering post journaled in said intermediate bearing opening for rotation about a vertical axis;
said steering post having a control sprocket disposed thereon below said base member; and
an endless chain for interlocking the control sprocket and each of the wheel sprockets;
the rotation of said steering post being operable to drive said chain to rotate each of said shafts about its vertical axis and thereby control the angular displacement of the support means for the individual camera equipment mounted on each of said shafts while said carriage is maintained in a given position.

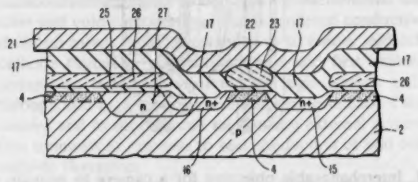
4,095,251

FIELD EFFECT TRANSISTORS AND FABRICATION OF INTEGRATED CIRCUITS CONTAINING THE TRANSISTORS

Robert H. Dennard, Croton-on-Hudson, and Dominic P. Spampinato, Ozone Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,948
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **24 Claims**

1. A field effect transistor (FET) which comprises:
(A) semiconductive substrate of a first conductive type containing active impurities of a first conductive type;
(B) FET channel region containing active impurities of said first conductive type;
(C) FET gate insulator over the channel region;
(D) doped polycrystalline silicon gate over said channel region and said FET gate insulator; wherein the boundaries of said polycrystalline silicon gate determine the boundaries of said channel region in both the width and length directions;
(E) doped source region of second and opposite conductive type; said source region being self-aligned with respect to one end of the FET gate in the length direction;
(F) doped drain region of a second and opposite conductive type; said drain region being self-aligned with respect to the other end of the FET gate in the length direction;
(G) field oxide to isolate said FET from other like FETs and from other structures and circuits on the same semiconductive substrate;
(H) said field oxide being nonrecessed with respect to the source and drain regions;
(I) said field oxide isolation being self-aligned with respect to



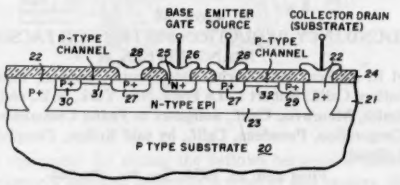
the sides of the FET gate in the width direction, and said gate neither overlapping nor underlapping said field oxide isolation;
(J) insulation layer at least over the FET source, and FET drain, but not over the FET gate;
(K) a metallic-type high electrical conductivity interconnection line;
(L) a self-registering electrical connection between the polycrystalline silicon gate and said interconnection line;
(M) contact holes to provide vias for achieving electrical connection to FET source and drain regions;
(N) metallic-type high electrical conductivity interconnection lines making electrical connection to said FET source and drain regions through said vias; and
(O) electrical connections to said semiconductive substrate.

4,095,252

COMPOSITE JFET-BIPOLAR TRANSISTOR STRUCTURE

Sam S. Ochi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 27, 1976, Ser. No. 754,290
Int. Cl.[2] H01L *27/02, 29/80, 29/72, 29/06*
U.S. Cl. 357—43 **6 Claims**



1. A monolithic integrated circuit comprising:
a semiconductor substrate of a first conductivity type;
an epitaxial layer deposited on said substrate and having a second conductivity type;
a ring of diffused semiconductor material passing through said epitaxial layer and having said first conductivity type, said ring isolating a section of said epitaxial layer;
an emitter region of said first conductivity type contained within and extending from the surface thereof and part way through said isolated section of said epitaxial layer;
a contact region of said second conductivity type making

ohmic contact with said isolated portion of said epitaxial layer; and

a channel region of said first conductivity type extending between said emitter region and said isolation region over a portion of said epitaxial layer and extending into said epitaxial layer a distance that is small compared to the distance said emitter region extends into said epitaxial layer.

4,095,253

SINGLE IN-LINE HIGH POWER RESIN-PACKAGED SEMICONDUCTOR DEVICE HAVING AN IMPROVED HEAT DISSIPATOR

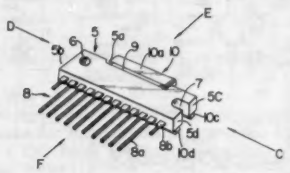
Masayoshi Yoshimura, Tokyo; Keizo Otsuki, Higashiyamato; Senji Shoji, Tokorozawa; Tomio Yamada; Ichio Shimizu, both of Kodaira, and Yuji Arai, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 23, 1976, Ser. No. 744,397

Claims priority, application Japan, Nov. 29, 1975, 50-142794

Int. Cl.[2] H01L *23/38, 23/42, 23/44*

U.S. Cl. 357—81 **17 Claims**



1. A resin-packaged semiconductor device having a resin-molded package defined by a plurality of principal surfaces interconnected by a plurality of side surfaces, a plurality of external leads projecting in parallel to each other from one side surface of said resin-molded package, comprising:

a heat sink fin mounting plate projecting from a side surface of the resin-molded package opposite to said one side surface from which said external leads project; and

a heat sink fin having one end portion overlapping said heat sink fin mounting plate and the remaining portion extending from said fin mounting plate into overlapping contact with substantially the entire area of at least one of said plurality of principal surfaces of said resin-molded package, said one end portion of the heat sink fin being connected in close contact with said heat sink fin mounting plate.

4,095,254

TRANSCODER FOR COLOR TELEVISION SIGNALS

Rene Romeas, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Oct. 13, 1976, Ser. No. 731,938

Claims priority, application France, Oct. 17, 1975, 75 31902

Int. Cl.[2] H04N *9/42*

U.S. Cl. 358—11 **13 Claims**

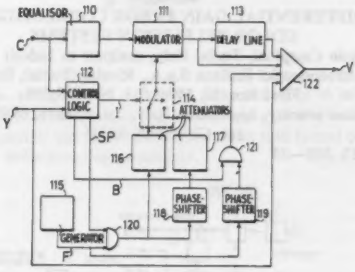
1. A colour television transcoder for transcoding an input signal comprising a first sequence of a first and a second chrominance signals having respectively a first and a second fixed amplitude, a common duration and alternating at a line frequency, into an output signal comprising a sub-carrier modulated by simultaneously said two chrominance signals, said transcoder comprising:

equalising means receiving said input signal for bringing the amplitude/frequency curves of said chrominance signals to one and the same contour, delivering a first and a second equalized chrominance signals;

means for generating a second sequence of a first and a second sub-carriers alternating at said line frequency and synchronously with said first sequence; said first and second sub-carriers having respectively a third and a fourth fixed amplitude and a fixed common frequency, and the second sub-carrier being in quadrature with the first sub-carrier;

means for setting the ratio of said first fixed amplitude to said third fixed amplitude at a first value, and for setting the ratio of said second fixed amplitude to said fourth fixed amplitude at a second value;

a single balanced modulator receiving said first and second sequence for modulating respectively said first and second sub-carriers with said first and second equalized chrominance signals, delivering a modulated signal;



means for delaying said modulated signal by said duration, delivering a delayed signal;

adding means for adding said modulated signal and said delayed signal, delivering said output signal; and

control means for extracting from said first sequence a chrominance synchronisation signal and for combining said chrominance synchronisation signal with an external line synchronisation signal and an external field synchronisation signal for emitting a switch signal for controlling the alternance of said first and second sub-carriers and the setting of said first and second value of said ratios.

4,095,255

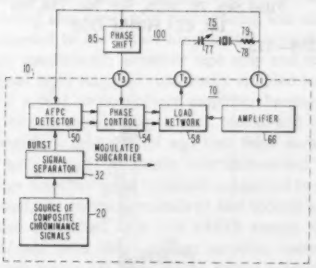
CONTROLLED OSCILLATOR WITH INCREASED IMMUNITY TO PARASITIC CAPACITANCE

Willem Hendrik Groeneweg, Ottenbach; Alois Vaclav Tuma, Schlieren, both of Switzerland, and Leopold Albert Harwood, Bridgewater, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 7, 1977, Ser. No. 785,591

Int. Cl.[2] H04N *9/44;* **H03B** *3/04, 5/00*

U.S. Cl. 358—17 **11 Claims**



1. A controlled oscillator comprising:

an amplifier including an active device having an output terminal, said output terminal having a parasitic capacitance associated therewith;

a filter network arranged in a feedback loop of said amplifier for providing regenerative feedback of sufficient magni-

tude to produce an oscillatory signal at said output terminal of said active device;

a source of control signals providing control signals at an output terminal, said output terminal having a parasitic capacitance associated therewith; and

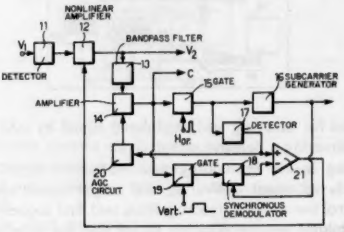
a common load network for said oscillatory and control signals coupled to said filter network, said common load network comprising amplifying means having a low input impedance relative to an impedance presented by said parasitic capacitances to said oscillatory and control signals.

4,095,256

DIFFERENTIAL GAIN ERROR CORRECTION IN COLOR TELEVISION SYSTEMS

Armando Campioni, Turin, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Rivalta (Turin), Italy

Filed Jun. 23, 1976, Ser. No. 699,298
Claims priority, application Italy, Jul. 1, 1975, 68681 A/75
Int. Cl.² H04N 9/535
U.S. Cl. 358—35 **5 Claims**



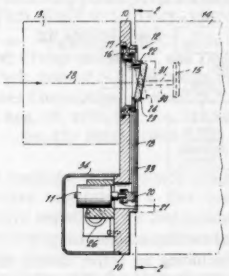
1. A color television system, comprising a transmitter means for transmitting an amplitude-modulated carrier, and including means for inserting into the transmitted signal during the line blanking interval a color synchronizing burst signal with constant amplitude having the frequency of a subcarrier, means for inserting periodically into the said transmitted signal, at least once in every field scan, a second signal having a different mean amplitude and a different phase from the burst signal and a constant amplitude, and receiver means including means for comparing the amplitude of the second signal with that of the burst signal to correct differential gain distortion.

4,095,257

ORBITER FOR PYROELECTRIC FOCUSING DEVICES

Frank G. Back, Glen Cove, N.Y., assignor to Zoomar, Inc., Glen Cove, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,705
Int. Cl.² H04M 3/06
U.S. Cl. 358—113 **3 Claims**



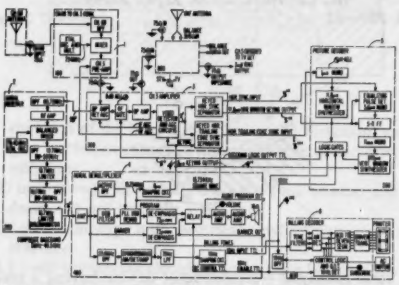
1. An orbiter for pyroelectric focusing devices having an image plane comprising means for focusing infrared radiation upon the image plane; a pyroelectric target positioned in the image plane for showing an image of the focused radiation; a plate, transparent to infrared radiation, mounted in front of the image plane, said plate having parallel inclined entry and exits faces; a rotatable mounting means for said plated disposed normal to the optical axis of the focusing device; means to rotate the mounting means about the optical axis; an adjustable speed control for the said rotating means; and an elastomer belt driven by the rotating means and operatively connected to the mounting means for turning said mounting means.

4,095,258

APPARATUS FOR DECODING SCRAMBLED TELEVISION AND SIMILAR TRANSMISSIONS

Martin Sperber, Cranford, N.J., assignor to Blonder-Tongue Laboratories, Inc., Old Bridge, N.J.

Filed Oct. 15, 1976, Ser. No. 732,607
Int. Cl.² H04N 1/44
U.S. Cl. 358—120 **12 Claims**



1. In a system for decoding radio-frequency broadcasted scrambled television transmissions containing a modulation-suppressed train of horizontal synchronizing signals within a predetermined time window and at a predetermined line rate and including equalizing pulses, vetical synchronizing signals periodically modulation-suppressed at reference equalizing signals in the horizontal synchronizing signal train within an encoded video carrier signal, a modulation frequency signal corresponding to that used for the suppression modulation but advanced in time, and a pilot signal of frequency substantially the same as that or a multiple of the horizontal synchronizing signal line rate; apparatus having, in combination, means for receiving as radio-frequency signals said transmissions; radio-frequency gating means connected with the receiving means to receive said transmissions; video detector means connected to said radio-frequency gating means to demodulate said video carrier containing modulation-suppressed horizontal and vertical synchronizing signals; horizontal synchronizing signal and horizontal trailing edge synchronzing signal separator means connected with said video detector means; aural demodulation means connected to said receiving means for demodulating said pilot signal independently of and isolated from said video detector means and for recovering said advanced modulation frequency signal; means connected with the pilot signal demodulating means for controlling the said horizontal trailing edge synchronizing signal separator means in response to said demodulated pilot signal and in response to the keying of a pulse of width less than said window substantially centered at the trailing edge of the suppressed horizontal synchronizing signal; picture decoder means comprising means responsive to the outputs of the horizontal synchronizing signal separator means and the horizontal trailing edge synchronizing signal separator means for generating a delay for the said horizontal synchronizing signal window of a horizontal line and thereby providing a horizontal window decoding pulse; and means for applying said horizontal window decoding pulse to said radio-frequency gating means to restore the suppressed synchroniz-

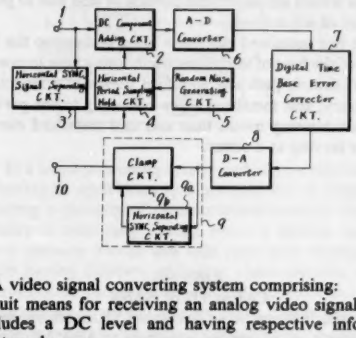
ing signals, thereby to restore an unscrambled television transmission.

4,095,259

VIDEO SIGNAL CONVERTING SYSTEM HAVING QUANTIZATION NOISE REDUCTION

Kiyoshi Sawagata, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 21, 1976, Ser. No. 698,003
Claims priority, application Japan, Jun. 24, 1975, 50-77973
Int. Cl.[2] H04N 7/04, 5/78
U.S. Cl. 358—141 6 Claims



1. A video signal converting system comprising:

circuit means for receiving an analog video signal that includes a DC level and having respective information intervals;

level shifting means connected to said circuit means to shift the DC level of said video signal to different random values at equally spaced intervals, said level shifting means comprising random noise generating means for generating a noise signal having a level which changes randomly from one information interval to the next and which remains constant throughout each respective information interval, and means for changing the DC level of said video signal in successive information intervals with said noise signal such that said video signal DC level is constant throughout a respective information interval and then changes in the next successive interval;

digitizing means connected to said level shifting means to receive therefrom the analog video signal with the shifted DC level;

signal utilization means for receiving and utilizing the digitized level-shifted video signal from said digitizing means;

converting means connected to said signal utilization means for receiving and converting the digitized video signal to an analog level-shifted video signal; and

clamping means connected to said converting means to restore said analog video signal to its original DC level.

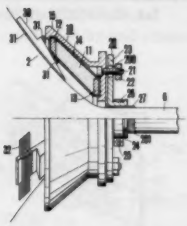
4,095,260

COLOR PICTURE TUBE DEVICE

Hirofumi Suzuki, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1977, Ser. No. 787,749
Claims priority, application Japan, Apr. 19, 1976, 51-43541; Apr. 19, 1976, 51-48099[U]
Int. Cl.[2] H04N 5/657
U.S. Cl. 358—248 6 Claims

1. In an electromagnetic deflection in-line electron gun type colour picture tube device including a colour picture tube with a neck portion and funnel portion and a deflection yoke device mounted near the joint between said neck portion and said funnel portion and provided with a deflection yoke assembly having an inner diameter sufficiently larger than the joint neck portion and funnel portion such that said deflection yoke assembly can move in a direction perpendicular to the tube axis, the improvement wherein said deflection yoke device comprises supporting means for supporting said deflection yoke assembly having a first portion movable along said neck portion and a second portion disposed substantially perpendicular to said first portion but tiltable with respect to the tube axis,



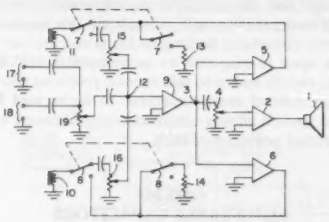
means for securing said deflection yoke assembly to said second portion of said supporting means, and at least two wedge means inserted and fixed in a gap between said funnel portion and said deflection yoke assembly.

4,095,261

AUDIO TAPE RECORDER, EDITOR AND AMPLIFYING SYSTEM

Jesus Rodriguez, 1966 First Ave., No. 3C, New York, N.Y. 10029

Filed Jan. 7, 1976, Ser. No. 647,079
Int. Cl.[2] G11B 27/02
U.S. Cl. 360—13 6 Claims



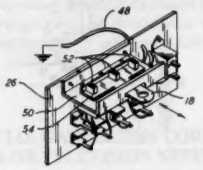
1. A public address apparatus comprising dual track magnetically sensitive tape transport means, first and second recording heads being also capable of reproducing and electromagnetically coupled to individual longitudinal recording tracks on a unitary magnetically sensitive tape strip and not to each other, a signal input terminal electrically coupled to the input terminals of a first audio voltage amplifier having an audio speaker at the output terminals thereof, second and third audio voltage amplifiers, said second and said third audio voltage amplifiers having input terminals, said second and said third audio voltage amplifier input terminals connected to said signal input terminal, the output terminals of said second audio voltage amplifier connected to a first switch means, the output terminals of said third audio voltage amplifier connected to a second switch means, said first switch means adapted to alternatively selectively connect said first recording head to the output terminals of said second audio voltage amplifier and said signal input terminals, said second switch means adapted to alternatively selectively connect said second recording head to the output terminals of said third audio voltage amplifier and said signal input terminal, means to connect an audio frequency voltage signal to said signal input terminal.

4,095,262

LIGHTNING PROTECTION CIRCUIT

Homer F. St. Clair, Levanna Rd., Aurora, N.Y. 13026

Filed Dec. 27, 1976, Ser. No. 754,355
Int. Cl.[2] H02H 1/04
U.S. Cl. 361—1 7 Claims



1. A circuit arrangement for protecting an electrical appliance having a chassis ground, an antenna input circuit and a power supply circuit from the effects of lightning, said circuit arrangement comprising, in combination:

(a) a power lead-in wire connected at one end to first terminal means on the appliance and at the other end to a source of electrical power;

(b) first switch means interposed between said power lead-in wire and the power supply circuit of the appliance and movable between first and second positions, connecting and disconnecting, respectively, said power lead-in wire and the power supply circuit;

(c) at least one antenna lead-in wire connected at one end to second terminal means on the appliance and at the other end to an antenna;

(d) second switch means interposed between said one antenna lead-in wire and the antenna input circuit of the appliance and movable between first and second positions, connecting and disconnecting, respectively, said antenna lead-in wire and the antenna input circuit;

(e) a single line electrically connecting the power supply circuit and antenna input circuit of the appliance in a common circuit and leaving said first and second terminal means open in response to movement of said first and second switch means to said second positions thereof; and

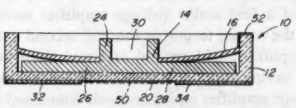
(f) switch control means operable to move said first and second switch means simultaneously between said first and second positions of each.

4,095,263

ADJUSTABLE CAPACITORS

John E. Johanson, Boonton, N.J., assignor to Johanson Manufacturing Corporation, Boonton, N.J.

Filed Aug. 31, 1976, Ser. No. 707,152
Int. Cl.[2] H01G 5/06, 5/04
U.S. Cl. 361—292 10 Claims



1. An adjustable capacitor comprising:

a unitary dielectric housing means having a base and a sidewall emanating therefrom, said housing means integrally fabricated from a material having specific dielectric characteristics, and serving as a dielectric for said capacitor;

an electrically conductive rotor member placed within said housing, said rotor member having a central hub and at least one thin blade plate member emanating perpendicularly from the base of said hub to communicate with the inner dielectric surface of said housing base, the outer extent of said blade plate terminating short of abutting said housing means sidewall;

a bendable metal retainer member having a dimension slightly greater than the inner dimensions of said dielectric housing means sidewall and having centrally disposed bore circumscribing said rotor hub such that said retainer captivates itself in a spring-like manner within said housing means sidewall, its surface being in a convex-concave relation to exert inward and outward pressure to seal said capacitor assembly about said sidewall and about said rotor hub and to exert downward pressure upon said rotor blade plate member; and

a recess within the upper end portion of said hub to provide means of adjustment;

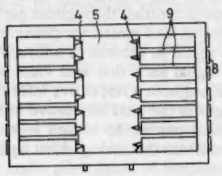
at least one metalized electrode layer secured to the lower side of the base of said dielectric housing base to complete the dielectric path and to afford means of connection to circuitry, said metalized layer extending to the periphery of said housing means base and said metalized electrode layer serving as a stator.

4,095,264

CAPACITOR BANK

Ake Danemar, Lidingo; Arne Johansson, Grangesberg, and Owe Nerf, Farsta, all of Sweden, assignors to Asea AB, Vasteras, Sweden

Filed Sep. 8, 1976, Ser. No. 721,500
Claims priority, application Sweden, May 7, 1976, 7605216
Int. Cl.[2] H01G 1/08
U.S. Cl. 361—274 3 Claims



1. A capacitor bank for use in high voltage electric plants, comprising capacitor units:

a rack of insulating material for supporting and electrically insulating said capacitor units from one another;

a tank enclosing said rack and said capacitor units and including an insulating fluid for regulating the temperature in said tank;

said rack including guide conduits for circulating at least part of said fluid to each of said capacitor units to maintain the temperature thereof at a predetermined value;

said capacitor units are mounted within said rack to provide channels between the capacitor units and between the capacitor units and the tank for circulation of said fluid therein, and said capacitor units are mounted in two spaced columns, the capacitors in each column being mounted with their respective terminal bushings extending into the space formed between said two columns;

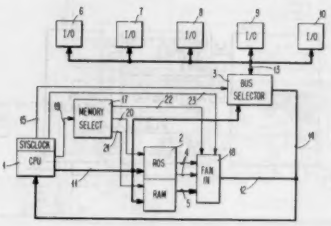
said rack includes wall members for separating the rack into an upper and a lower half and in turn for separating each of said upper and lower halfs into two columns with a shaft extending therebetween from said lower half to said upper half; and

said tank including conduits for introducing said fluid into said shaft and each of said columns.

4,095,265
MEMORY CONTROL STRUCTURE FOR A PIPELINED MINI-PROCESSOR SYSTEM

Richard Alan Vrba, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,816
Int. Cl.[2] G06F *13/00*; G11C *7/00*
U.S. Cl. 364—200 **5 Claims**



1. In a word processing system including a pipelined processor having an input bus, a system clock, and an output bus, and including a plurality of random access memory blocks and a plurality of read only storage memory blocks, said random access memory blocks and said read only storage memory blocks having different operating characteristics, a memory control system interconnected to said processor and said memory blocks for controlling access to the memory blocks by the processor, wherein the memory control system comprises:

means for receiving clock signals from said processor;

means responsive to said clock signals for generating memory cycle timing signals having a plurality of frequencies required to operate said memory blocks;

means for receiving an address and an instruction from said processor;

decoding means responsive to said address and instruction for generating and applying power selection signals and one of said memory cycle timing signals only to the memory block which contains the address equivalent to the address received from said processor; and

sampling means for latching the output of the selected memory block onto the input bus to the processor concurrent with the receipt of the next address and instruction from the processor.

4,095,266
DATA-PROCESSING SYSTEM WITH A SET OF PERIPHERAL UNITS REPETITIVELY SCANNED BY A COMMON CONTROL UNIT

Giovanni Carubia, Mariano Comense; Roberto Papa, and Cesare Pratelli, both of Milan, all of Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Nov. 1, 1976, Ser. No. 737,269
Claims priority, application Italy, Oct. 30, 1975, 28867 A/75
Int. Cl.[2] G06F *9/16*
U.S. Cl. 364—200 **8 Claims**

1. In a data-processing system wherein a central unit successively communicates with a multiplicity of associated peripheral units in respective phases of a recurrent scanning cycle individually assigned to said peripheral units, said central unit including a processor and a programmer delivering to said processor a series of instructions for the exchange of data with any peripheral unit during respective subphases of a phase assigned thereto,

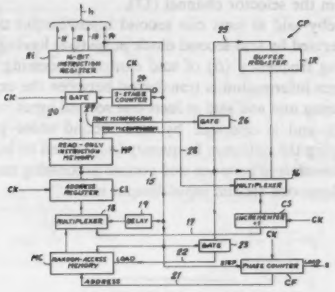
the improvement wherein said programmer comprises:

storage means containing instructions to be read out to said processor;

address-counting means connected to said storage means for identifying the locations of instructions to be read out during consecutive subphases of each phase of a scanning cycle, certain of said instructions carrying a characteristic portion commanding a phase change;

phase-counting means connected to said storage means for stepping in response to said characteristic portion of an instruction read out therefrom;

memory means controlled by said phase-counting means for



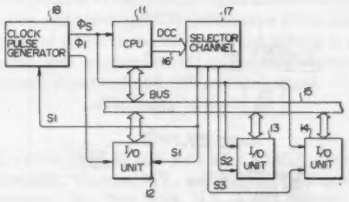
introducing an initial count into said address-counting means at the beginning of each new phase to identify the location of the first of a series of instructions to be fed to said processor during said new phase; and

stepping means for progressively increasing the count of said address-counting means during successive subphases of each phase.

4,095,267
CLOCK PULSE CONTROL SYSTEM FOR MICROCOMPUTER SYSTEMS

Takao Morimoto, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,519
Claims priority, application Japan, Nov. 29, 1975, 50-142567
Int. Cl.[2] G06F *1/04*
U.S. Cl. 364—200 **8 Claims**



1. A clock pulse control system for microcomputer systems, comprising:

a central processing unit (**11**);

a plurality of first input/output units (**13,14**) connected to said central processing unit (**11**);

at least one second input/output unit (**12**) connected to said central processing unit (**11**);

a selector channel (**17**) connected between said central processing unit (**11**) and said first and second input/output units and adapted to selectively issue a select signal (**S1**) and to select at least one of said first and second input/output units according to a programmed control instruction from said central processing unit; and

a clock pulse generator (**18**) connected to said selector channel **17**, to said central processing unit (**11**) and to said first and second input/output units for supplying clock pulses to said central processing unit and to said first and second input/output units, and adapted to generate a first clock pulse (ϕs) having a frequency (fs) to operate said central

processing unit and said first input/output units (13,14) and a second clock pulse (ϕ1) having an optimum frequency (n-fs) to operate said at least one second input/output unit (12) when no select signal (S1) is applied to the generator (18) from the selector channel (17) and having the operating frequency (fs) of said central processing unit when a select signal (S1) is applied to the generator (18) from the selector channel (17),

whereby said at least one second input/output unit (12) is operated by said second clock pulse (ϕ1) having the operating frequency (fs) of said central processing unit only when information is transferred between the central processing unit and said at least one second input/output unit (12), and is operated by said second close pulse (ϕ1) having the optimum frequency (n-fs) when no information is transferred between said central processing unit and said at least one second input/output unit.

4,095,268

SYSTEM FOR STOPPING AND RESTARTING THE OPERATION OF A DATA PROCESSOR

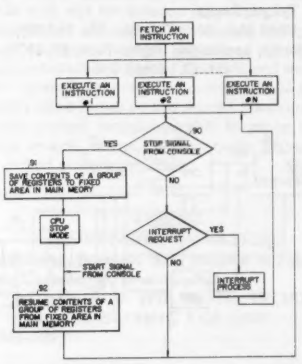
Yoshiki Kobayashi; Tadaki Bandoh; Hideo Maejima, all of Hitachi, and Hajime Yasuda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 9, 1976, Ser. No. 712,803

Claims priority, application Japan, Aug. 8, 1975, 50-95770

Int. Cl.[2] G06F *1/04, 3/02*

U.S. Cl. 364—200 **5 Claims**



1. A system for stopping and restarting the operation of a data processor, which has a central processing unit which is operative under the existence of a timing signal, a console from which start and stop signals are supplied to the central processing unit, and a main memory, the contents of which can be directly accessed by the central processing unit and the console, the system comprising

means for suspending an executed program and assigning the contents of a group of registers within said central processing unit to predetermined fixed areas of said main memory in response to a stop signal from said console,

means for stopping the timing signal of said central processing unit after said assignment of the contents, and

means for restarting the timing signal of said central processing unit and restoring the contents of said fixed areas to said group of registers in response to the start signal from said console.

4,095,269

DATA PROCESSING SYSTEM HAVING A HIGH SPEED BUFFER MEMORY

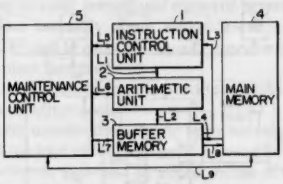
Shun Kawabe, Hino, and Kouichiro Omoda, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 1, 1976, Ser. No. 728,625

Claims priority, application Japan, Oct. 1, 1975, 50-117732

Int. Cl.[2] G06F *13/00*

U.S. Cl. 364—200 **5 Claims**



1. In a data processing system having:

a main memory for storing data which includes instruction words and operands;

a buffer memory, coupled to said main memory, for storing, by way of data transfer from said main memory, part of the data stored in said main memory;

an instruction control unit, coupled to said buffer memory, for decoding instruction words read out of said buffer memory and for obtaining operand addresses; and

an arithmetic unit, coupled to said instruction control unit and said buffer memory, for processing instruction words decoded by said instruction control unit in response to operands read out from said buffer memory in accordance with operand addresses from said instruction control unit;

the improvement comprising:

first means, including said instruction control unit, for detecting that an instruction word read out from said buffer memory corresponds to a prescribed type of instruction in accordance with which said arithmetic unit successively utilizes a sequence of operands which are stored in successive regions of said main memory; and

second means, coupled to said main memory, said buffer memory, said instruction control unit, and said first means, for successively causing each operand in said sequence of operands to be transferred from said main memory to said buffer memory in accordance with an operand address from said instruction control unit, in response to said first means detecting said prescribed type of instruction.

4,095,270

METHOD OF IMPLEMENTING MANUAL OPERATIONS

Arnold Blum, Gechingen; Horst von der Heyden, Boeblingen; Fritz Irro, Boeblingen; Guenter Knauft, Boeblingen; Stephan Richter, Boeblingen, and Hermann Schulze-Schoelling, Gaertringen, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 11, 1977, Ser. No. 776,576

Claims priority, application Germany, May 19, 1976, 2622140

Int. Cl.[2] G06F *9/18*

U.S. Cl. 364—200 **4 Claims**

1. A method of implementing manual operations in a processor in which several programs are executed under time slice control, wherein one of the programs is a designated control program to control manual operations as a function of controllable operating mode latches for selecting the required manual operations, comprising:

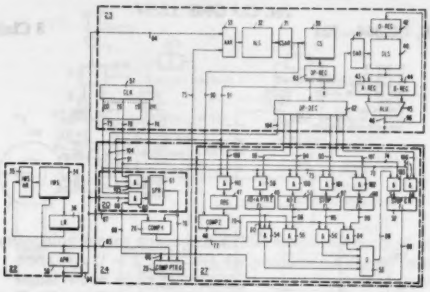
entering a program pointer for a selected program for which a manual operation is to be implemented into a stop pointer register;

generating an output signal indicating a stop condition has been reached;

comparing the access pointers supplied by a program pointer

logic with the program pointer entered in the stop pointer register, said comparison occurring before the next instruction of said selected program is again executed;

transferring in the case of a match the program pointer of the control program to force the execution of an instruction of



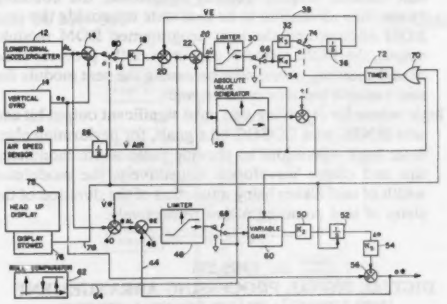
the control program for the manual operations, whereby, without stopping the execution of the unaffected programs, each time an instruction cycle occurs for the selected program for which a manual operation is to be implemented, these steps are repeated until the manually inputted operation is completed.

4,095,271

AIRCRAFT PITCH ATTITUDE SIGNAL GENERATOR

Hans Rudolf Muller, Kirkland, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Apr. 20, 1977, Ser. No. 789,153
Int. Cl.² G06G 7/78
U.S. Cl. 364—434 **35 Claims**



1. A computed pitch circuit for aircraft, responsive to a longitudinal acceleration signal source representing aircraft longitudinal acceleration, and a gyroscope based signal source representing aircraft pitch, comprising:

means for combining the acceleration signal with the gyroscope pitch signal to generate a computed acceleration signal;

means responsive to the acceleration signal and said computed acceleration signal for generating an inertial pitch signal; and

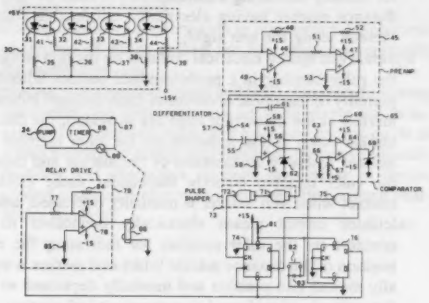
means responsive to said inertial pitch signal and the gyroscope pitch signal for generating a computed pitch signal.

4,095,272

AUTOMATIC TURBIDIMETRIC TITRATION

G. Jay Janzen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 11, 1977, Ser. No. 758,524
Int. Cl.² G06G 7/58; G01N 31/16
U.S. Cl. 364—497 **12 Claims**



1. Automatic turbidimetric titration apparatus comprising

means adapted to contain a liquid medium to be titrated;

titrant supply means adapted to introduce a turbidimetric titrant into said medium at a gradual rate;

optoelectronic means adapted to produce an analog measurement signal representative of the turbidity of the medium being titrated;

differentiating means adapted to produce, responsive to said analog measurement signal, a differentiated signal representative of the first derivative of said analog measurement signal;

means adapted to compare said differentiated signal with a reference signal and to produce a control signal when said differentiated signal has a predetermined relationship with said reference signal, said predetermined relationship being representative of the occurrence of the titration end-point; and

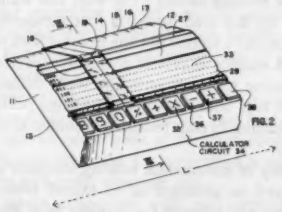
means responsive to said control signal adapted to produce a titration end-point signal representative of the amount of said titrant added to the medium being titrated in order to achieve said predetermined relationship between said reference signal and said differentiated signal.

4,095,273

ELECTRONIC SLIDE RULER CALCULATOR

James Gonzalez, Monroe, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 25, 1977, Ser. No. 771,892
Int. Cl.² G06F 7/38, 3/00
U.S. Cl. 364—705 **4 Claims**



1. An electronic slide ruler calculator for indicating a measured distance to a precise fraction of a predetermined scale, said ruler calculator comprising

an elongated ruler member having spaced opposite parallel first and second surfaces and a measuring straight edge at

the second surface, said measuring edge having a plurality of spaced distance indications marked thereat;

a distance marker slidably mounted for free movement along the length of the ruler member on the first surface thereof and having a hair sight extending transversely to the ruler member across the first surface and at the measuring edge for visually indicating a distance on the ruler device, said distance marker having electrically conductive contacts thereon along the hair sight;

a plurality of spaced electrical contacts on the first surface of the ruler member in a predetermined pattern whereby a plurality of fractional divisions of each distance indication marked at the measuring edge are provided, the distance marker being spring mounted on the ruler member in a manner whereby the contacts of the marker and those of the ruler member directly thereunder make electrical contact when said marker is manually depressed; and

calculator circuit means electrically connected to the contacts on the ruler member for indicating the exact position of the distance marker when said marker is manually moved into position and manually depressed so that the contacts of said marker make electrical contact with contacts of said ruler member directly thereunder.

4,095,274

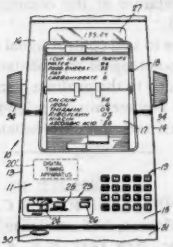
APPARATUS FOR DETERMINING FOOD CONTENT

Carl Gordon, 1203 S. Spaulding Ave., Los Angeles, Calif. 90019

Filed Apr. 27, 1977, Ser. No. 791,321

Int. Cl.[2] G06F *15/42*

U.S. Cl. 364—715 **4 Claims**



1. A device comprising:

a hollow housing having a top wall, side walls and a bottom wall, the top wall having a first substantially horizontal portion and a second portion integral with the first portion which extends angularly upwardly therefrom;

said housing top wall including walls defining an opening which is in both said first and second portions;

an axle having its ends rotatably mounted in the housing side walls;

a plurality of information bearing elements carried by said axle and so arranged as to extend within the housing opening and adapted for viewing from the housing exterior;

a pushbutton digital calculator having the pushbuttons mounted on the housing top wall portion; and

a display means for the digital calculator mounted on the housing top wall second portion above the opening therein.

4,095,275

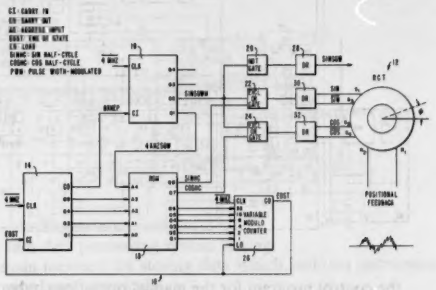
PULSE WIDTH MODULATED SINE COSINE GENERATOR

Francis A. Fluet, Longwood, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 14, 1977, Ser. No. 768,130

Int. Cl.[2] G06F *15/34*

U.S. Cl. 364—721 **8 Claims**



1. A digital waveform generator for deriving sine and cosine waves by pulse width modulation comprising:

counting means having a plurality of states, comprising a plurality of lesser significant bits and a most significant output bit;

read only memory (ROM) means having a plurality of address inputs for receiving said lesser significant bits and having a plurality of programmed output bits, two of said latter bits defining a sine half cycle (SINHC) and a cosine half cycle (COSHC), the remaining ROM output bits defining a modulo,

variable modulo counting means having a plurality of inputs connected to receive said modulo output from said ROM means, and to deliver an end of state (EOST) signal to said counting means;

means for clocking connected to said counting means and to said variable modulo counting means, whereby

when the variable modulo counter has counted to its capacity the EOST signal is sent to said counting means, and said variable modulo counter is enabled, the counting means then advancing to its next state to provide the next ROM address and the next programmed ROM modulo output, the ROM modulus output from the previous state of said counting means now becoming the next modulo for said variable modulo counter; and

logic means for receiving said most significant output bit and said SINHC and COSHC bit signals, for performing algebraic logic operations to provide pulse width modulated sine and cosine waveforms respectively, the modulated width of said waves being a function of the duration of the states of said counting means respectively.

4,095,276

DIGITAL SIGNAL PROCESSING ARRANGEMENT INCLUDING A WAVE DIGITAL FILTER

Gerard Verkroost, Mierlo, and Hans-Jurgen Butterweck, Geldrop, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,548

Claims priority, application Netherlands, Dec. 22, 1975, 7514908

Int. Cl.[2] G06F *15/34;* H03H *7/10*

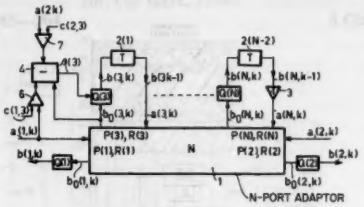
U.S. Cl. 364—724 **8 Claims**

1. A digital signal processing arrangement comprising at least one wave digital filter including at least one N-port adaptor with ports P(i), (i = 1, 2, . . . N), each port including an input and an output, at least one of the ports P(i) being of the purely capacitive type;

means connected to said filter for supplying digital informa-

tion signal waves $a(1,k)$, $a(2,k)$, . . . $a(r,k)$ through the input of each of r ports ($r < N$);

means connected to said filter for supplying auxiliary digital signal waves $a(i,k)$, where $i = r+1, \ldots N$, through the input of each of the remaining ports; and



quantizing means connected to the output of each of said ports P(j), ($j = 1, 2, \ldots N$), for producing a digital output signal wave $b(j,k)$ quantized at a predetermined word-length, said quantizing means producing at each of said purely capacitive ports P(i) a digital output signal wave $b(j,k)$ such that each $b(j,k)$ satisfies the relationship

$$|b(j,k) - \sum_{i=1}^{r} c(i,j)a(i,k)| \leq |b_o(j,k) - \sum_{i=1}^{r} c(i,j)a(i,k)|$$

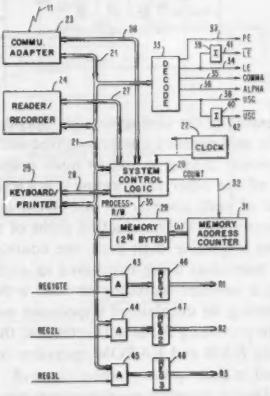
in which $c(n,j)$, with $n = 0, 1, 2, \ldots r$, represents a constant characteristic of the j^{th} purely capacitive port, and $b_o(j,k)$ represents a non-quantized version of the digital output signal wave $b(j,k)$.

4,095,277

METHOD FOR COMMUNICATING TEXT COMMANDS AND INSTRUCTIONS USING CONVENTIONAL CODED TEXT CHARACTERS AND A STRUCTURE FOR DECODING AND PRESENTING COMMAND AND INSTRUCTION SIGNALS

Robert Glenn Bluethman, and William Weller Boyd, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,822
Int. Cl.[2] G06F *3/12*
U.S. Cl. 364—900 **12 Claims**



1. A method of transmitting conventional coded text and printer control signals representing text, printer control, command and instruction signals in a transparent and unstructured format comprising the steps of:

providing a command delimiter including a conventional line end signal (LE) and a conventional comma signal (,) immediately preceding each command to be transmitted for entering a command mode;

encoding a following command in conventional alphabetic characters of which at least the first character represents the command;

providing an instruction delimiter including a conventional line end signal (LE) for each concatenated instruction following a command;

encoding a following instruction in conventional alphabetic characters of which at least the first character represents the instruction; and

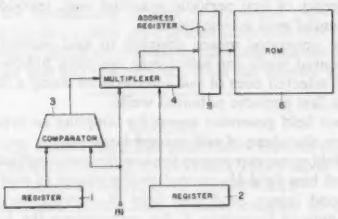
providing a conventional page end (PE) character following commands and instructions as set forth above for terminating the command mode and returning to text mode in which a recipient device will reproduce all conventionally encoded text characters received and utilize as device control characters all conventional encoded control characters received.

4,095,278

INSTRUCTION ALTERING SYSTEM

Toshimasa Kihara, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 6, 1976, Ser. No. 729,983
Claims priority, application Japan, Oct. 8, 1975, 50-120702
Int. Cl.[2] G06F *9/06*
U.S. Cl. 364—900 **5 Claims**



1. An instruction altering system to be used with program and microprogram control systems having instruction storage means and address register means connected with said instruction storage means comprising:

first register mean for storing an operation code for an instruction stored in said storage means which is to be altered;

second register means for storing a second operation code for an instruction stored in said storage means;

input means for providing an operation code of an instruction which is to be executed;

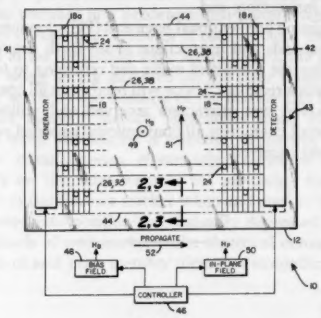
comparator means connected with said first register means and said input means for comparing said first operation code and said operation code of the instruction which is about to be executed and for generating a coincidence signal when said codes coincide; and

multiplexer means connected with said second register means, said input means, said comparator means and said address register means for transferring said second operation code to said address register instead of the operation code of said instruction which is about to be executed when said coincidence signal is received from said comparator means.

4,095,279
ORTHOGONAL POTENTIAL WELL MATRIX AND AMPLITUDE MODULATED BIAS FIELD FOR BUBBLE DOMAIN PROPAGATION

Stanley James Lins, Bloomington, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 8, 1977, Ser. No. 785,807
Int. Cl.[2] G11C *19/08*
U.S. Cl. 365—29 4 Claims



1. A bubble domain propagation apparatus, comprising:

a first layer of a magnetizable material in which are formed a plurality of parallel, spaced-apart first periodic potential wells;

a second layer of a magnetizable material in which are formed a plurality of parallel, spaced-apart second periodic potential wells which are orthogonally oriented with respect to said plurality of parallel, spaced-apart first periodic potential wells in said first layer for forming a plurality of first periodic potential well, second periodic potential well intersections;

bubble generator means coupled to said second periodic potential wells for selectively coupling bubble domains into selected ones of said intersections along a first one of said first periodic potential wells;

in-plane field generator means for coupling an in-plane field H_P in the plane of said second layer; and,

bias field generator means for coupling an amplitude modulated bias field H_B normal to the planes of said first and second layers, said bias field H_B having an amplitude modulated frequency F for propagating the bubble domains along the associated second periodic potential well from upstream to next adjacent downstream intersection at said frequency F at successive cycles of said amplitude modulated bias field H_B.

4,095,280
ELECTRICAL INFORMATION STORAGE SYSTEM USING A LAYER OF PARTICULATE PHOTOSENSITIVE MATERIAL

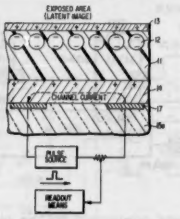
Koji Okumura, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 539,913, Jan. 9, 1975, Pat. No. 4,059,443. This application Jul. 2, 1976, Ser. No. 702,154
Int. Cl.[2] G11C *11/42*
U.S. Cl. 365—112 5 Claims

1. A method of retrieving electrical information from an electrical information storage member, comprising:

providing an electrical information storage member comprising a layer of substantially electrically insulating material containing a layer of particulate electrically photosensitive material, a semiconductor layer contacting one surface of said layer of substantially electrically insulating material, a substantially transparent electrode layer of electrically conductive material contacting the opposite surface of said layer of substantially electrically insulating material and a plurality of electrode pairs contacting said semiconductor layer, said storage member having electrical information stored as charges established in selected ones of the photosensitive particles,

selectively pulsing a current to each of said electrode pairs,

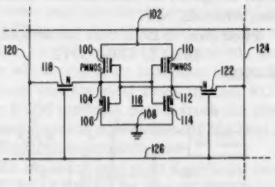


and detecting the relative magnitudes of currents channeling through the semiconductor layer between each of said electrode pairs, the relative magnitudes of said currents corresponding to the presence of charges in selected ones of the photosensitive particles.

4,095,281
RANDOM ACCESS-ERASABLE READ ONLY MEMORY CELL

George Denes, Austin, Tex., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 4, 1976, Ser. No. 663,752
Int. Cl.[2] G11C *11/40, 17/00*
U.S. Cl. 365—156 4 Claims



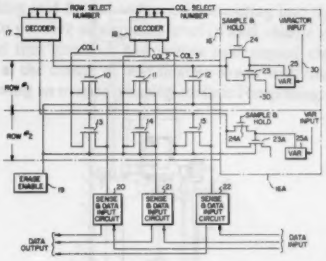
1. In a memory of the kind selectively operable in RAM and ROM modes, said memory comprising first and second inverters, each inverter having an output node cross-coupled to an input node of the other for forming a static RAM cell, the output node of each inverter of said RAM cell being selectively connected via the conduction paths of separate access transistors to respective digit lines, the control electrodes of said access transistors being connected to a common control line and each inverter including at least a first field effect transistor having an unbalanced impedance means associated therewith for providing ROM data retention, the improvement for providing RAM and EAROM operation of said memory, characterized in that:

said unbalanced impedance means comprises a first variable-threshold transistor connected as a load in the drain circuit of said first field effect transistor in said first inverter and having a control electrode connected to the output of said second inverter; and a second variable threshold transistor connected as a load in the drain circuit of said first field effect transistor in said second inverter and having a control electrode connected to the output of the first inverter.

4,095,282
MEMORY INCLUDING VARACTOR CIRCUIT TO BOOST ADDRESS SIGNALS

Harry G. Oehler, Glen Burnie, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1976, Ser. No. 744,377
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—204 3 Claims

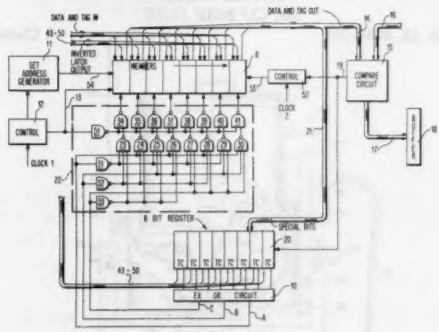


1. An MNOS memory array comprising:
a. an array of MNOS memory transistors, said array being arranged in columns and rows;
b. first addressing means responsive to a first digital signal to generate a column select signal;
c. second addressing means responsive to a second digital signal to generate a row select signal; and
d. varactor means responsive to said row select signal and a write mode signal to boost said row select signal when said memory is in the write mode.

4,095,283
FIRST IN-FIRST OUT MEMORY ARRAY CONTAINING SPECIAL BITS FOR REPLACEMENT ADDRESSING

John Edward Campbell, and Gerhard Robert Thompson, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1976, Ser. No. 702,363
Int. Cl.[2] G11C *8/00*
U.S. Cl. 365—230 9 Claims

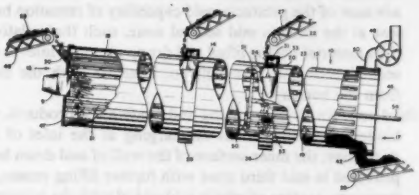


1. A first in - first out memory comprising:
at least three storage members,
each said member including a plurality of bit storage means, one of said means storing a special bit,
Gray code encoding circuit means,
means for coupling each said special bit storage means to the input of said encoding circuit means,
member selection means coupled between said encoding circuit means and said members for selecting one of said members in accordance with the output of said circuit means, and
means for changing the state solely of the special bit storage means included within the member selected by said selection means.

4,095,284
DIRECT HEATING ASPHALT-AGGREGATE RECYCLE APPARATUS AND METHOD

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 603,357, Aug. 11, 1975, Pat. No. 3,999,743, and a continuation-in-part of Ser. No. 729,705, Oct. 5, 1976. This application Dec. 27, 1976, Ser. No. 754,315
Int. Cl.[2] B28C *5/20*
U.S. Cl. 366—7 9 Claims

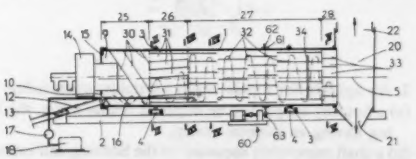


1. An apparatus for heating and mixing asphalt-aggregate composition comprising:
an elongated rotatable cylindrical drum having means for supplying hot gases of combustion therein at a first end and means for recovering composition at a second opposite end,
means for introducing coarse composition particles into said drum in a hot zone adjacent said first end,
means for introducing smaller composition particles into said drum in a cooler zone spaced from said first end, and
a plurality of lifters secured along the drum interior adjacent the first end and spaced apart from the interior surface.

4,095,285
DEVICE FOR THE PREPARATION OF COATED PRODUCTS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS

Pierre Malbrunot, Saint-Cloud, France, assignor to Creusot-Loire, Paris, France

Filed Oct. 1, 1976, Ser. No. 728,793
Claims priority, application France, Oct. 8, 1975, 75 30788
Int. Cl.[2] B28C *5/08*
U.S. Cl. 366—23 16 Claims



1. A device for the preparation of coated products from aggregate, powdery matter and binder, comprising a platform, a cylindrical dryer and mixer drum having an inlet end and an outlet end, means mounting said drum for rotation about its longitudinal axis on said platform, means for driving said drum in rotation, means for continuously feeding aggregate and powdery matter to said inlet end of said drum, a burner projecting into said inlet end of said drum, a fixed chamber for discharge of coated product and for exhaust of the gases in circulation in the drum, said fixed chamber being in communication with said outlet end of said drum, means for supplying

binder to said drum, said drum being arranged so that said inlet end is at a level higher than the level of said outlet end to promote the circulation of the products in said drum, said drum comprising in succession in the direction of flow of the products therethrough from said inlet end;

a first zone for introduction of aggregate and powdery matter supplied by said feeding means, and including blades projecting inwardly of the drum arranged in a spiral on the inner surface of the wall of said drum,

a second zone for preheating and predrying of the aggregate and homogenization of the mixture of aggregate and powdery matter, and including means for lifting the aggregate and powdery matter provided on the inner surface of said drum, the transverse section of said lifting means taken in a plane perpendicular to the axis of said drum being variable along said second zone such that the capability of retention of said lifting means increases in the direction of advance of the products, said capability of retention being low at the inlet to said second zone, such that relatively little material will be lifted and dropped at said inlet to said second zone and thus will not interfere with the flame from the burner,

third zone for drying, mixing and heating the products, said binder supplying means discharging at the inlet of said third zone, the inner surface of the wall of said drum being provided in said third zone with further lifting means, the transverse section of which is identical with the transverse section of said lifting means at the outlet of said second zone, said further lifting means having a high capability of retention such that the products form a substantially continuous curtain across the whole transverse section of said drum at the inlet of the third zone to isolate the third zone and the binder supplying means from the second zone.

4,095,286

AGITATOR FOR PAINT SPRAY CANS

Jerry Ellis, 6520 Shadowlawn, Dearborn Heights, Mich. 48127

Filed Jan. 5, 1976, Ser. No. 646,537

Int. Cl.² B01F *7/18*

U.S. Cl. 366—293 **7 Claims**

1. An agitator for a paint spray assembly, comprising:

(a) a housing adapted to be disposed within a cup, the housing having an internal cavity,

(b) a shaft removably mounted to the housing and extending through the housing, the shaft having an enlarged splined section disposed within the cavity,

(c) a vaned paddle wheel mounted on the shaft exteriorly of the housing,

(d) a first lateral bore formed in the housing and extending radially outwardly from the cavity and defining means for delivering pressurized fluid to the cavity to rotate the shaft by the impingement of fluid on the spline, and

(e) a second lateral bore formed in the housing and extending laterally outwardly from the cavity, the bore being axially offset from the first bore, the second bore defining means for exhausting the fluid from the cavity.

4,095,287

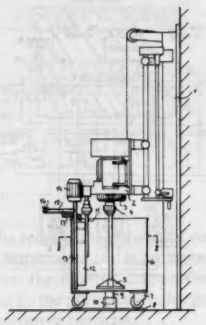
EMPTYING APPARATUS FOR PASTY MATERIALS

Hans-Josef Felser, and Kurt Paul Kley, both of Cologne, Germany, assignors to Bonaval-Werke GmbH, Bonn, Germany

Filed Mar. 3, 1976, Ser. No. 663,425

Int. Cl.² B01F *15/02, 7/20, 9/10*

U.S. Cl. 366—194 **4 Claims**



1. An emptying apparatus for pasty materials comprising a cylindrical container which is rotatable about its axis by means of an eccentrically located stirring element within the container, a strip-shaped baffle extending along the wall of the cylindrical container approximately parallel to the container axis, said baffle having one vertical edge mounted to rotate in fixed vertical positions about its vertical axis and the other free edge being free and movable to different vertical positions, so that the angle which the said baffle makes with the container wall can be adjusted, a spiral pump, means attaching said spiral pump to the free edge of the baffle and an outlet pipe attached to the pump outlet.

4,095,288

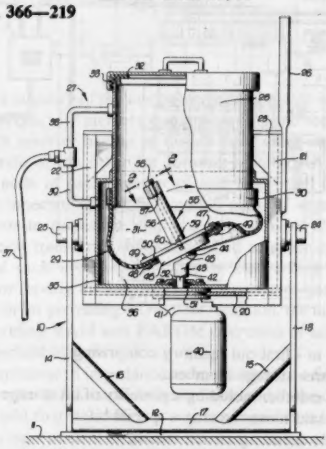
VARIABLE AGITATOR MIXER

Leslie H. Garlinghouse, 1585 Sierra Madre Villa, Pasadena, Calif. 91107

Continuation of Ser. No. 575,141, May 7, 1975, abandoned, Ser. No. 340,670, Mar. 13, 1973, abandoned, and Ser. No. 364,881, May 29, 1973, Pat. No. 3,962,892. This application Mar. 3, 1977, Ser. No. 774,193

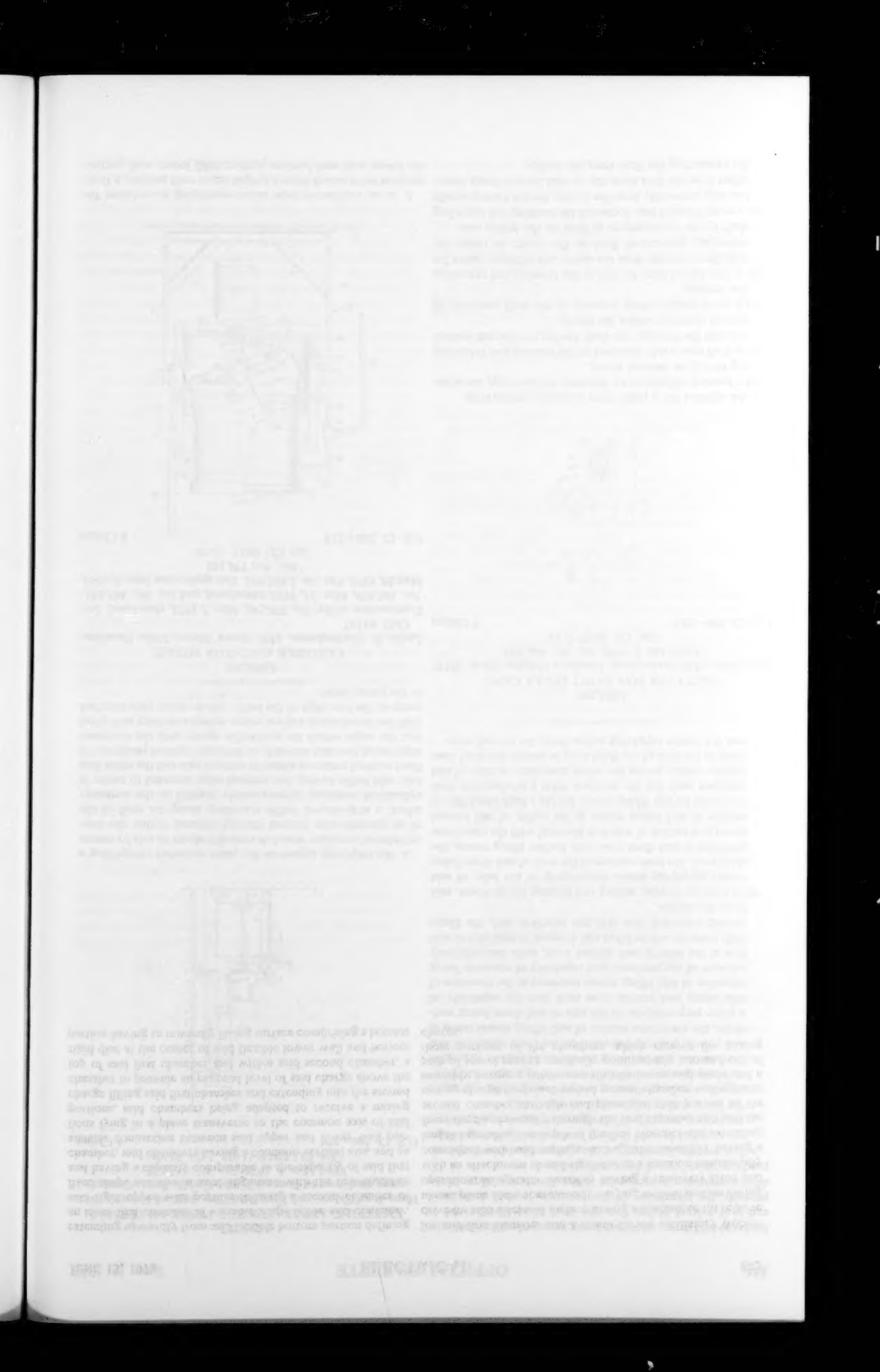
Int. Cl.² B01F *13/00*

U.S. Cl. 366—219 **6 Claims**



1. In an oscillatory type mixer employing a container for material to be mixed having a rigid upper wall portion, a flexible lower wall and bottom portion, said lower wall portion

extending upwardly from said flexible bottom portion defining an inner first chamber of variable shape inside said container, said rigid upper wall portion forming a second chamber of fixed shape and size in axial alignment with the first chamber and having a capacity comparable to the capacity of said first chamber, said chambers having a common vertical axis, and an annular connection between said upper and lower wall portions lying in a plane transverse to the common axis of said portions, said chambers being adapted to receive a mixing charge filling said first chamber and extending into the second chamber to provide an exposed level of said charge above the top of said first chamber and within said second chamber, a rigid disc at the center of said flexible lower wall and bottom portion having an inwardly facing surface comprising a bottom for said first chamber and a motor-driven oscillatory wobble drive for said disc, said surface having a continuous tilt relative to said plane and a continuously varying wobble motion during operation, an agitator assembly having a relatively fixed end with an attachment to said rigid disc at a location substantially coincident with said surface, said agitator assembly having a length exceeding the depth of the first chamber and extending from the disc inwardly through the first chamber and into the second chamber through said plane and that portion of the mixing charge contained in said second chamber, said agitator assembly having a continuous tilt relative to said plane and a path of travel passing cyclically continuously into and out of those portions of the chambers which receive the mixing charge.



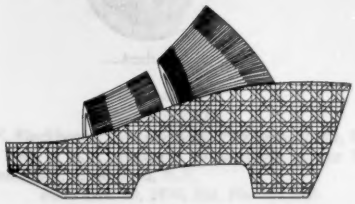
for mixing blending [illegible] and [illegible] a [illegible] [illegible] [illegible] with an attachment [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] second chamber [illegible] and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] a [illegible] level [illegible] [illegible] [illegible] [illegible] those portions of the chambers which [illegible] the mixing charge.

extending upwardly from said flexible bottom portion defining in [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] said container, said rigid upper wall portion defining a second chamber of [illegible] [illegible] [illegible] [illegible] alignment with the [illegible] and having a capacity comparable to the capacity of said first chamber, said chambers having a common vertical axis, and an annular connection between said upper and lower wall portions lying in a plane transverse to the common axis of said portions, said chambers being adapted to receive a mixing charge filling said first chamber and extending into the second chamber to provide an exposed level of said charge above the top of said first chamber and within said second chamber, a rigid disc at the center of said flexible lower wall and [illegible] portion having an inwardly facing surface comprising a bottom

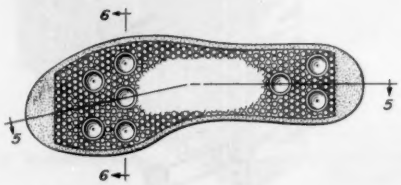
DESIGNS

JUNE 13, 1978

248,126
SHOE
Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 12, 1976, Ser. No. 676,166
Term of patent 3½ years
Int. Cl. D2—*04*
U.S. Cl. D2—292



248,127
OUTER SOLE FOR FOOTWEAR
Vijay Batra, 685 Oak St., Brockton, Mass. 02401
Filed Feb. 6, 1976, Ser. No. 655,748
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

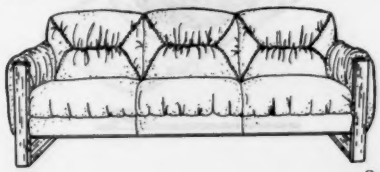


248,128
COMBINED RAZOR BLADE CARRIER AND DISPENSER
Joseph Scott Mineo, 22119 Runnymede St., Canoga Park, Calif. 91303
Filed Jul. 12, 1976, Ser. No. 704,516
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

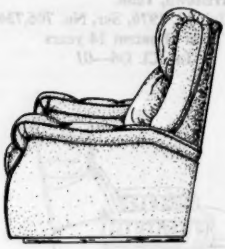
248,129
LOUNGE CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Jul. 19, 1976, Ser. No. 706,734
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37

248,130
CHAIR
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Jun. 15, 1976, Ser. No. 696,214
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56

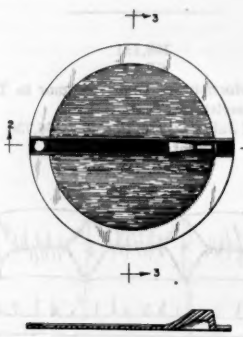
248,131
SEAT
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Jul. 19, 1976, Ser. No. 706,736
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



248,132
LOUNGE CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Jul. 19, 1976, Ser. No. 706,735
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71



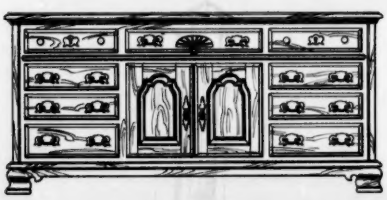
248,133
SINK STOPPER
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Aug. 19, 1976, Ser. No. 715,714
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—86



248,134
TUB STOPPER
Sidney J. Shames, 57 Holly Pl., Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Cir., Ardsley, N.Y. 10502
Filed Aug. 19, 1976, Ser. No. 715,729
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—86

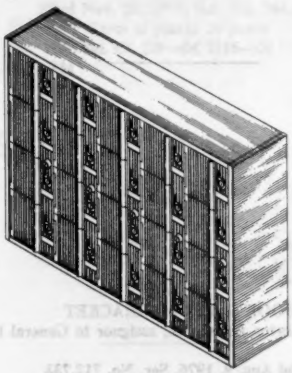
248,135
HANGER FOR COLLAPSIBLE TUBES
Albert H. Torongo, Jr., Yardley, Pa., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 6, 1976, Ser. No. 748,023
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—87

248,136
DRESSER OR SIMILAR ARTICLE
Harold V. Aulbert, High Point, N.C., assignor to Vaughan Furniture Company, Incorporated
Filed Nov. 2, 1976, Ser. No. 738,125
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—154

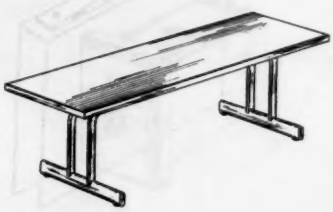


248,137
TABLE OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Nov. 8, 1976, Ser. No. 739,996
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—146

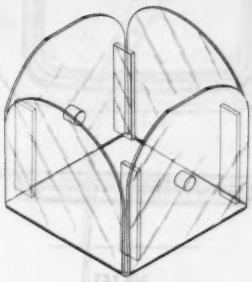
248,138
LOCKER
Wells F. Stackhouse, Ashville, and Douglas A. Barth, Sinclairville, both of N.Y., assignors to American Locker Security Systems, Inc., Jamestown, N.Y.
Filed Oct. 19, 1976, Ser. No. 735,610
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—170



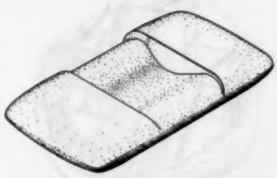
248,139
TABLE OR SIMILAR ARTICLE
Warren D. Petersen, St. Charles, Ill., assignor to Burd, Inc., Howell Division
Filed Nov. 8, 1976, Ser. No. 739,997
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



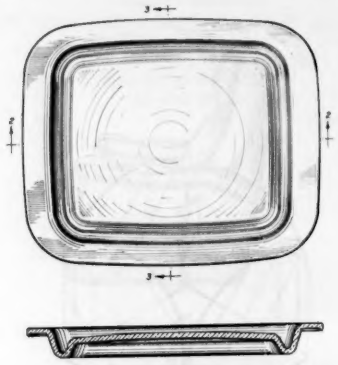
248,140
ACCESSORY HOLDER FOR FOOD PROCESSORS
Barbara Comfort, Landgrove, and Frederik George Richard von Roth, Peru, both of Vt., assignors to Acrylic Designs, Inc., South Londonderry, Vt.
Filed Jun. 4, 1976, Ser. No. 692,925
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181



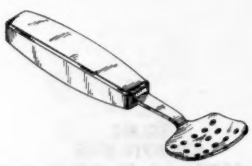
248,141
PILLOW
Audre C. Forsland, 923 23rd Ave. West, Virginia, Minn. 55792
Filed Jan. 13, 1976, Ser. No. 648,750
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



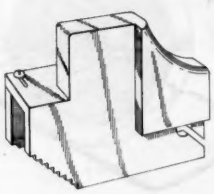
248,142
BROWNING GRIDDLE OR THE LIKE FOR MICROWAVE OVENS
Richard W. Greger, Corning, N.Y., assignor to Corning Glass Works
Filed Feb. 20, 1976, Ser. No. 659,661
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—87



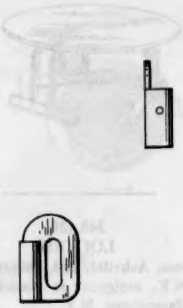
248,143
SERVING SPOON
Thomas G. Cannon, Ft. Collins, Colo., and Spencer L. Mackay, Glendale, Calif., assignors to Teledyne Industries, Ft. Collins, Colo.
Filed Dec. 13, 1976, Ser. No. 757,792
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—140



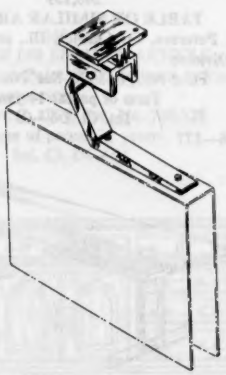
248,144
MULTI-PURPOSE JIG FOR USE WITH TABLE SAWS
Lloyd D. Kreitz, P.O. Box 60, Pequot Lakes, Minn. 56472
Filed Dec. 27, 1976, Ser. No. 753,986
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—14



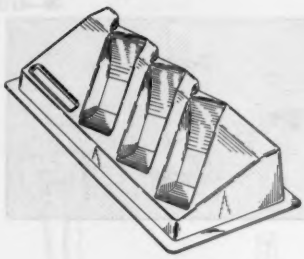
248,145
LOCKING PLATE
Junius T. Moore, Jr., Charleston, W. Va., assignor to The Moore Company, Inc., Charleston, W. Va.
Filed Mar. 7, 1977, Ser. No. 775,412
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—344



248,146
BOOK SUPPORT BRACKET
Gerard Drag, Morton Grove, Ill., assignor to General Binding Corporation
Filed Aug. 9, 1976, Ser. No. 712,733
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—363

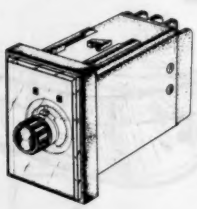


248,147
RIBBON CARTRIDGE CADDY
Joseph A. Rauch, Tivon, Israel, and Arthur P. Wales, Riverside, Conn., assignors to SCM Corporation, New York, N.Y.
Filed Oct. 18, 1976, Ser. No. 733,615
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—189



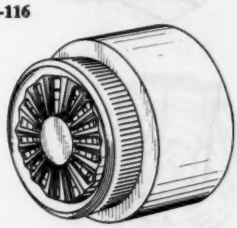
248,148
DEVELOPER POWDER CONTAINER
Davis W. Chamberlin, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.
Filed Nov. 24, 1976, Ser. No. 744,689
Term of patent 14 years
Int. Cl. D9—*04;* D16—*04*
U.S. Cl. D9—224

248,149
MOTOR TIMER
Teizo Fujita, and Toshiro Ohashi, both of Osaka, Japan, assignors to Izumi Denki Company Limited, Osaka, Japan
Filed Aug. 2, 1976, Ser. No. 711,084
Claims priority, application Japan, Apr. 5, 1976, 51-12571; Apr. 5, 1976, 51-12572; Apr. 5, 1976, 51-12573; Apr. 5, 1976, 51-12574
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40

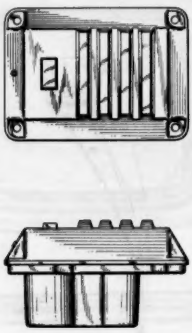


248,150
COMBINED MOISTURE AND LIGHT METER FOR PLANTS
Samuel J. Koch, 51 El Pueblo, Scotts Valley, Calif. 95066
Filed Oct. 28, 1975, Ser. No. 625,944
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—56

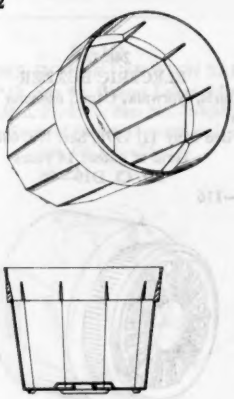
248,151
ELECTRIC BUZZER
Rudolph M. Duris, Norwalk, Conn., assignor to General Signal Corporation
Filed May 11, 1976, Ser. No. 685,206
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—116



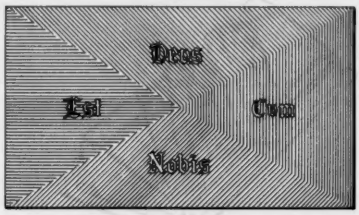
248,152
SIREN
Hank Hastings, Rocky Mount, N.C., assignor to Carolina Enterprises, Inc., Tarboro, N.C.
Filed Aug. 19, 1976, Ser. No. 716,001
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—120



248,153
PLANT POT
Saburo Yoshida, Hayward, Calif.; Harold R. Appelblom, deceased, late of South San Francisco, Calif., by Mae H. Appelblom, administratrix, assignors to Sunnyside Nurseries, Inc., Hayward, Calif.
Filed May 25, 1977, Ser. No. 800,471
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



248,154
FLAG
Everardo P. Sierra, 1809 W. Buckeye Rd., Space #20, Phoenix, Ariz. 85007
Filed Nov. 1, 1976, Ser. No. 737,663
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D11—167



248,155
ELECTRIC CAR
Cheston Lee Eshelman, 621 NE. 30th Ter., Miami, Fla. 33137
Filed Oct. 6, 1976, Ser. No. 729,886
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—92

248,156
CAR FRONT BUMPER
Michel Tixier, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France
Filed Dec. 23, 1975, Ser. No. 643,674
Claims priority, application France, Jul. 1, 1975, 75 73.993
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

248,157

ELECTRODE FRAME FOR USE IN AN ELECTROLYTIC FILTER PRESS CELL APPARATUS OR THE LIKE

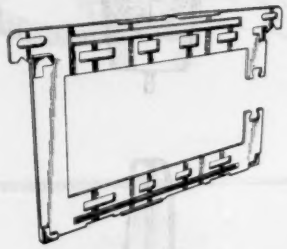
Gary C. Ganzi, Watertown; Kenneth O'Donoghue, Cambridge, and Anil D. Jha, Littleton, all of Mass., assignors to Ionics, Inc., Watertown, Mass.

Filed May 19, 1976, Ser. No. 688,431

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—40



248,158

HEADSET-HARDHAT ADAPTER

Clifford D. Read, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Aug. 16, 1976, Ser. No. 714,621

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—94

248,159

COFFEE MILL

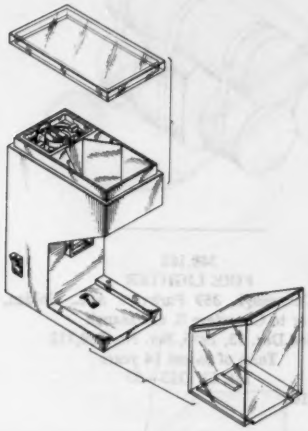
Husazo Maejima, Tokyo, Japan, assignor to Sachie Andov, Tokyo, Japan

Filed Sep. 9, 1976, Ser. No. 722,057

Term of patent 14 years

Int. Cl. D7—*04;* D15—*08*

U.S. Cl. D15—100



248,160

PHOTO ADAPTER MICROSCOPE ACCESSORY

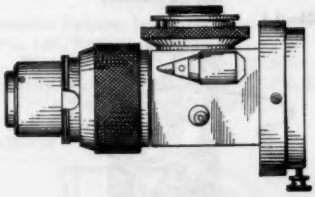
Richard E. Feinbloom, New York, and Laszlo Endrodi, Elmhurst, both of N.Y., assignors to Designs for Vision, Inc., New York, N.Y.

Filed Jun. 7, 1976, Ser. No. 693,633

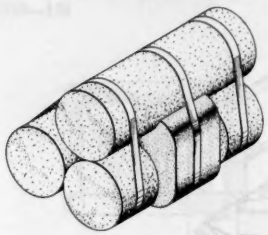
Term of patent 14 years

Int. Cl. D16—*05*

U.S. Cl. D16—38

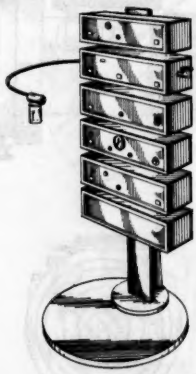


248,161
COMBINED SOLID FUEL UNIT AND IGNITER
Charles J. Dalzell, 940 N. 6th Ave., Yakima, Wash. 98902
Filed Nov. 11, 1976, Ser. No. 741,140
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—166



248,162
FIRE LIGHTER
Genevieve S. Cavanaugh, 359 Parkview Ave., Golden, Colo. 80401, assignor to Genevieve S. Cavanaugh
Filed Dec. 15, 1976, Ser. No. 750,712
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—166

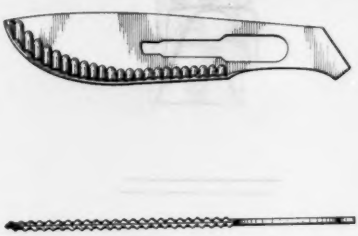
248,163
SKIN CARE EQUIPMENT AND STAND APPARATUS
Wallace A. Roberts, 88 N. Main St., Bellingham, Mass. 02019
Filed Jan. 5, 1977, Ser. No. 757,072
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



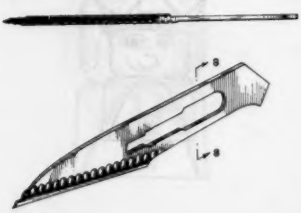
248,164
SPHYGMOMANOMETER
Mace Hudson Bell, 14 Pine Point Rd., Rowayton, Conn. 06853, and David Lee Haas, 80 County St., Norwalk, Conn. 06852
Filed Apr. 14, 1977, Ser. No. 787,355
Term of patent 14 years
Int. Cl. D24—*02*; D10—*07*
U.S. Cl. D24—21

248,165
INFRAMAMMARY DISSECTOR INSTRUMENT
Charles A. Wilson, 1704 Riggins Rd., Tallahassee, Fla. 32303
Filed Jun. 7, 1976, Ser. No. 693,802
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—28

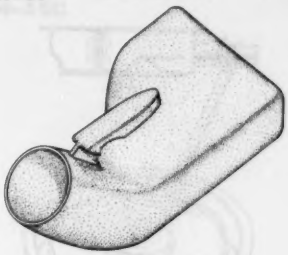
248,166
BLADE FOR SURGICAL KNIFE
Ryoji Kanai, Seki, Japan, assignor to Feather Kogyo Kabushiki Kaisha, Mino, Japan
Filed Aug. 27, 1975, Ser. No. 608,403
Claims priority, application Japan, Jun. 13, 1975, 50-23977
Term of patent 14 years
Int. Cl. D24—*02;* D28—*03*
U.S. Cl. D24—29

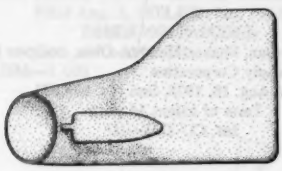


248,167
BLADE FOR SURGICAL KNIFE
Ryoji Kanai, Seki, Japan, assignor to Feather Kogyo Kabushiki Kaisha, Mino, Japan
Filed Aug. 27, 1975, Ser. No. 608,404
Claims priority, application Japan, Jun. 13, 1975, 50-23976
Term of patent 14 years
Int. Cl. D24—*02;* D28—*03*
U.S. Cl. D24—29



248,168
MALE URINAL
Gordon Kelly, Elm Grove, Wis., assignor to Bamis Manufacturing Company, Sheboygan Falls, Wis.
Filed Apr. 11, 1977, Ser. No. 786,307
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—54





248,169
HAIR DRYER
Shinji Yamamoto, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Kadoma, Japan
Filed Sep. 28, 1976, Ser. No. 727,544
Claims priority, application Japan, Apr. 2, 1976, 51-12327
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

248,170

MANUAL CONTROL VALVE FOR ANESTHETIC GASES

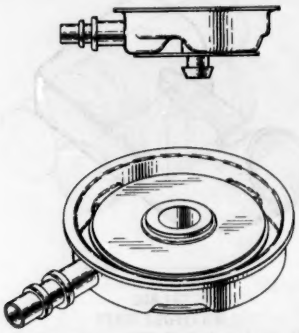
Allan M. Steigerwald, Rte. 3, Box 1000, Port Angeles, Wash. 98362

Filed Dec. 1, 1976, Ser. No. 746,621

Term of patent 14 years

Int. Cl. D29—*02, 99*

U.S. Cl. D29—7



248,171

CREMATION URN

Sanford A. Sugarman, Shaker Heights, Ohio, assignor to Superior Funeral Supply Corporation

Filed Aug. 18, 1975, Ser. No. 605,531

Term of patent 14 years

Int. Cl.[2] D31—*00*

U.S. Cl. D31—5

248,172

TOY FIGURE

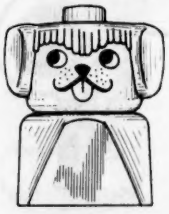
Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Aug. 2, 1976, Ser. No. 710,849

Term of patent 14 years

Int. Cl.[2] D21—*01*

U.S. Cl. D34—2 R



248,173

TOY FIGURE

Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Aug. 2, 1976, Ser. No. 710,663

Term of patent 14 years

Int. Cl.[2] D21—*01*

U.S. Cl. D34—4 R

248,174

TOY FIGURE

Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Aug. 2, 1976, Ser. No. 710,661

Term of patent 14 years

Int. Cl.[2] D21—*01*

U.S. Cl. D34—4 R

248,175

TOY FIGURE

Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland

Filed Aug. 2, 1976, Ser. No. 710,662

Term of patent 14 years

Int. Cl.[2] D21—*01*

U.S. Cl. D34—4 R

248,176
TOY FIGURE
Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Aug. 2, 1976, Ser. No. 710,847
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

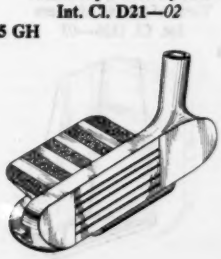
248,177
TOY FIGURE
Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Aug. 2, 1976, Ser. No. 710,848
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

248,178
TOY FIGURE
Erik Peter Tapdrup, Virum, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Aug. 2, 1976, Ser. No. 710,851
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

248,179
GOLF CLUB
Edward J. Riley, Pebble Beach, Calif., assignor to The Pinseeker Corporation, Pacific Grove, Calif.
Filed Jul. 12, 1976, Ser. No. 704,488
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC

248,180
GOLF PUTTER HEAD
Raymond E. Carrier, 1017 N. Lake St., Burbank, Calif. 91502
Filed Aug. 2, 1976, Ser. No. 711,052
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

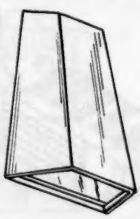
248,181
GOLF PUTTER HEAD
Walter I. Cervantes, 789 Promontory Dr. West, Newport Beach, Calif. 92660
Filed Dec. 29, 1976, Ser. No. 755,250
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



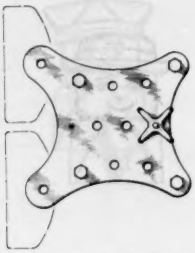
248,182
CANDLE HOLDER
John Anthony Mason Garcia, 1818 Hancock St., Los Angeles, Calif. 90031
Filed Nov. 15, 1976, Ser. No. 741,974
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2

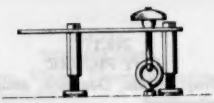
248,183
CANDLE HOLDER
John Anthony Mason Garcia, 1818 Hancock St., Los Angeles, Calif. 90031
Filed Nov. 15, 1976, Ser. No. 741,975
Term of patent 14 years
Int. Cl. D26—*01, 05*
U.S. Cl. D48—2

248,184
LAMP FOR ILLUMINATING DOOR LOCKS AND THE LIKE
Thomas Peter Roberts, 11 Lyons St., Glenroy, Victoria, 3046, Australia
Filed May 27, 1976, Ser. No. 690,739
Claims priority, application Australia, Nov. 27, 1975, 68196/75
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 B



248,185
DETACHABLE MULTI-PURPOSE LIGHT PLATFORM
Stanley J. Keyawa, 6500 Rexford Way, Carmichael, Calif. 95608
Filed Feb. 16, 1977, Ser. No. 768,974
Term of patent 14 years
Int. Cl. D26—*99*
U.S. Cl. D48—4 A

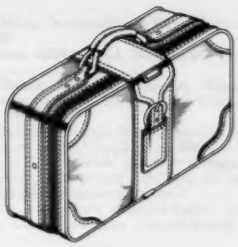




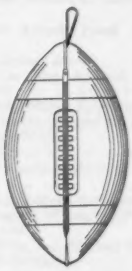
248,186
COVER FOR YARD LIGHT
Minas P. Hazerjian, 72 Stivaletta Dr., Dedham, Mass. 02026, and Kevork P. Hazerjian, 19 Woodard Rd., West Roxbury, Mass. 02132
Filed Dec. 20, 1976, Ser. No. 753,535
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—38

248,187
BAGPIPE PRACTICE CHANTER
George J. Roe, 2650 Lansing Ave. NE., Salem, Oreg. 97303
Filed Apr. 26, 1976, Ser. No. 679,887
Term of patent 14 years
Int. Cl. D17—*02*
U.S. Cl. D56—1 C

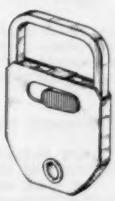
248,188
LUGGAGE CASE
Thomas D. Tweedie, Monrovia, Calif., assignor to Samsonite Corporation, Denver, Colo.
Filed Dec. 16, 1975, Ser. No. 641,300
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—5 G



248,189
UTILITY BAG
Judith J. Loomis, 232 Lafayette St., Memphis, Tenn. 38111
Filed Oct. 12, 1973, Ser. No. 405,762
The portion of the term of this patent subsequent to Feb. 13, 1987, has been disclaimed.
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 C



248,190
KEY RETAINER
Alfred E. Motzer, Meriden, Conn., assignor to The W. E. Bassett Company, Derby, Conn.
Filed Aug. 12, 1976, Ser. No. 713,895
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF JUNE, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Tauszig, Julio G., 4,095,236, Cl. 346-139.00C.

A P Products Incorporated: *See*—
Cacolici, Santo J., 4,094,564, Cl. 339-14.00L.

Aafjes, Herman: *See*—
Hyams, Irving; Koch, Harold S.; and Aafjes, Herman, 4,094,212, Cl. 81-3.800.

AAI Corporation: *See*—
Barr, Irwin R., 4,094,717, Cl. 156-197.000.

AB S. T. Powercell: *See*—
Siwersson, Olle Lennart; Wall, Arne Evert; and Nilsson, Olle, 4,095,015, Cl. 429-15.000.

Abend, Karl-Ludwig: *See*—
Scheyhing, Hans; Fleischer, Helmut; and Abend, Karl-Ludwig, 4,094,378, Cl. 180-105.00E.

Accelerators, Inc.: *See*—
Orr, F. D., Jr.; Templeton, L. F.; and Keutzer, Larry L., 4,095,115, Cl. 250-538.000.

Ad-Tec Products, Inc.: *See*—
Whelan, James P., 4,094,443, Cl. 221-63.000.

Adachi, Keiichi: *See*—
Tsujino, Nobuyuki; Ogawa, Akira; Shishido, Tadao; and Adachi, Keiichi, 4,094,683, Cl. 96-95.000.

Adams, Herbert. Two wheeled electrically powered vehicle. 4,094,374, Cl. 180-31.000.

Addmaster Corporation: *See*—
Busch, Richard E., 4,094,483, Cl. 248-73.000.

Addressograph-Multigraph Corporation: *See*—
Valancius, James P., 4,094,674, Cl. 96-1.0SD.

Adomanite, Yanina Antono: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

Agence Nationale de Valorisation de la Recherche: *See*—
Chedid, Louis A.; and Audibert, Francoise Marguerite, 4,094,971, Cl. 424-92.000.
Roig, Joseph Antoine, 4,094,540, Cl. 292-214.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Boucher, Bernard; Luzet, Daniel; and Sella, Claude, 4,094,764, Cl. 204-298.000.
Doncque, Pierre M., 4,094,375, Cl. 180-33.00A.

AGFA-GEVAERT: *See*—
Katz, Seymour; and Brown, Victor R., 4,095,111, Cl. 250-476.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Botta, Artur; von Konig, Anita; Moll, Franz; Rasp, Christian; and Hartl, Johannes, 4,094,811, Cl. 252-313.00R.
Haseler, Helmut; and von der Kall, Gunter, 4,094,448, Cl. 222-342.000.
Herzhoff, Peter; Gref, Hans; and Schweicher, Wolfgang, 4,095,063, Cl. 200-61.130.
Hujer, Friedrich; and Zangenfeind, Helmut, 4,094,726, Cl. 156-502.000.
Payrhammer, Bernd; and Treiber, Helmut, 4,094,604, Cl. 355-68.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Voltage supply regulated in proportion to sum of positive- and negative-temperature-coefficient offset voltages. 4,095,164, Cl. 323-8.000.

Aichinger, Horst; and Ebersberger, Hans, to Siemens Aktiengesellschaft. Radiation detector for an automatic X-ray exposure timer. 4,095,109, Cl. 250-374.000.

Aigl, Miroslav: *See*—
Stein, Klaus; Aigl, Miroslav; and Richter, Gerhard, 4,094,033, Cl. 15-41.00R.

Aimono, Yuuji: *See*—
Omori, Eiji; Aimono, Yuuji; Mukoyama, Yoshiyuki; and Sugitani, Hatuo, 4,094,835, Cl. 260-22.0CB.

Aishima, Tetsuo; and Nobuhara, Akio, to Kikkoman Shoyu Co., Ltd. Beef flavor substance, process for producing same and beef-flavoring agent. 4,094,997, Cl. 426-533.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Fukumoto, Ryoichi; and Igarashi, Toshiro, 4,094,100, Cl. 49-348.000.
Takeda, Shinji; Kobayashi, Shoji; and Watanabe, Yutaka, 4,094,056, Cl. 29-527.200.
Takeda, Shinji; Mitsui, Noriyoshi; and Kato, Nobuharu, 4,094,725, Cl. 156-497.000.
Yoshimura, Noboru, 4,094,489, Cl. 248-429.000.

Aizawa, Hiroshi: *See*—
Tsunekawa, Tokuichi; Uchidoi, Masanori; Nakamura, Zenzo; Taguchi, Tetsuya; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,095,242, Cl. 354-33.000.

Aizawa, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece inspection circuit. 4,094,136, Cl. 58-23.00R.

Akers, Donald J., to G & W Electric Specialty Company. Safety trip mechanism for multi-position switch. 4,095,065, Cl. 200-63.00R.

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Amberntsson, Jan Roger; Andersson, Roger Ingemar; and Sultan, Stig Bertil, 4,095,237, Cl. 346-140.00R.

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Ullmann, Werner; Fricker, Paul; and Guenin, Maurice, 4,095,079, Cl. 219-69.00E.

Akutsu, Hidezoh: *See*—
Yamazaki, Haruo; and Akutsu, Hidezoh, 4,095,135, Cl. 313-493.000.

Alan I. W. Frank Corporation: *See*—
Frank, Alan I. W., 4,094,952, Cl. 264-328.000.

Aldridge, Clyde L.: *See*—
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,094,765, Cl. 208-8.000.

Alexander, Martin; and Odeyemi, Oluwasuyi, to Cornell Research Foundation, Inc. Method for preparing a pesticidally resistant rhizobium and agronomic composition thereof. 4,094,097, Cl. 47-57.600.

Alexander, Robert R.: *See*—
Lester, David; and Alexander, Robert R., 4,094,685, Cl. 260-2.50B.

Alford, Frank A.: *See*—
Newton, David W.; and Alford, Frank A., 4,094,320, Cl. 128-303.140.

Alforge Metals Corporation, Limited: *See*—
Cook, Lloyd A.; Reynolds, Kim A.; and Mark, Werner J., 4,094,453, Cl. 228-265.000.

Alfrey, Turner, Jr.; and Schrenk, Walter J., to Dow Chemical Company, The. Multilayer coextrusion process for producing selective reflectivity. 4,094,947, Cl. 264-171.000.

All American Industries, Inc.: *See*—
Schlegel, William R.; and Mayhew, Harry E., Jr., 4,094,143, Cl. 60-352.000.

Alleau, Thierry; and Moracchioli, Robert, to Commissariat a l'Energie Atomique. Circuit for the supply of condensable fluid to a solar engine. 4,094,147, Cl. 60-641.000.

Allee, John W., to Brown & Root, Inc. Method for installing an offshore tower. 4,094,162, Cl. 61-96.000.

Allen-Bradley Company: *See*—
Struger, Odo J.; Searcy, William W.; and John, Ernest F., 4,095,094, Cl. 235-304.100.

Allen, Roy A.; and Scott, Leroy W., to Shell Oil Company. Waterborne epoxy resin coating compositions. 4,094,844, Cl. 260-29.300.

Alliance Machine Company, The: *See*—
Polen, Karl L., 4,094,493, Cl. 254-144.000.

Allied Chemical Corporation: *See*—
Nozik, Arthur J., 4,094,751, Cl. 204-80.000.

Allis-Chalmers Corporation: *See*—
Gallatin, Paul M., 4,095,200, Cl. 335-193.000.
Sanderson, Gerald D., 4,094,401, Cl. 198-827.000.

Allor Foundation: *See*—
Gilbert, Joseph G., 4,094,967, Cl. 424-28.000.

Alt, Gerhard H.; and Franz, John E., to Monsanto Company. Plant growth regulators. 4,094,661, Cl. 71-88.000.

Altair, Inc.: *See*—
Moore, Vincent; and Levesque, Paul N., 4,094,019, Cl. 4-312.000.

Altendorfer, Alois; and Stahrlinger, Anton, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Apparatus for simultaneously pivoting, tilting and rotating a lining brick. 4,094,418, Cl. 214-1.0BC.

Altenpohl, Paul J.: *See*—
Altenpohl, William F.; and Altenpohl, Paul J., 4,094,413, Cl. 209-121.000.

Altenpohl, William F.; and Altenpohl, Paul J. Poultry weighing and packing method. 4,094,413, Cl. 209-121.000.

Aluminum Company of America: *See*—
Cedro, Vito, III; Kinosz, Donald L.; and Lamberti, Thomas G., II, 4,094,815, Cl. 252-415.000.
Scanga, Theodore P.; and Callender, Robert E., 4,094,460, Cl. 229-43.000.

Smith, David A.; and Davidson, John J., 4,094,760, Cl. 204-181.00R.

Amann & Sohne: *See—*
Schmidt, Max Christof; and Huber, Richard, 4,094,476, Cl. 242-125.200.

Amax Inc.: *See—*
Symens, Raymond D.; Queneau, Paul B.; Chou, Eddie C. J.; and Clark, Franklin F., 4,094,754, Cl. 204-108.000.

Amberntsson, Jan Roger; Andersson, Roger Ingemar; and Sultan, Stig Bertil, to Aktiebolaget Electrolux. Ink jet printing head. 4,095,237, Cl. 346-140.00R.

American Brands, Inc.: *See—*
Frazier, Thomas Cecil; Ashworth, John Thomas; Chumney, Richard Douglas, Jr.; and Meyre, Rene Wilhelm, 4,094,323, Cl. 131-8.00R.

American Cyanamid Company: *See—*
Bernady, Karel Francis; Poletto, John Frank; and Weiss, Martin Joseph, 4,094,896, Cl. 260-456.00A.
Chang, Eugene Yue Chieh, 4,094,859, Cl. 260-47.00R.
Clarke, William J., 4,094,150, Cl. 61-36.00C.

American Home Products Corporation: *See—*
Teller, Daniel M.; and Sellstedt, John H., 4,094,979, Cl. 424-246.000.

American Optical Corporation: *See—*
McEachern, Robert A.; and Cavigelli, George A., 4,094,310, Cl. 128-2.06G.

American Sterilizer Company: *See—*
Moore, Vincent; and Levesque, Paul N., 4,094,019, Cl. 4-312.000.

Amfac Foods, Inc.: *See—*
Carlson, Bayard L., 4,094,123, Cl. 53-24.000.

AMP Incorporated: *See—*
Dola, Frank Peter; and Rossler, Frederick William, Jr., 4,094,566, Cl. 339-14.00R.
Lockard, Joseph LaRue, 4,095,074, Cl. 200-295.000.

Amtel, Inc.: *See—*
Griffiths, Evan, 4,094,180, Cl. 72-280.000.

Anamorphic Ltd.: *See—*
Ehrenhaft, Franz F., 4,095,099, Cl. 250-205.000.

Anderson, Arnold L., to Velsicol Chemical Corporation. Flame retardant plastic compositions. 4,094,858, Cl. 260-45.75B.

Anderson, Elvin Lowell; and Connelly, Gerald Aloysius, to SmithKline Corporation. Method of preparing aryloxybenzoic and arylthiobenzoic acids. 4,094,900, Cl. 260-520.00E.

Anderson, Todd B.: *See—*
Nangle, Bernard; McGaha, Patrick L.; Wallace, Thomas J.; and Anderson, Todd B., 4,095,119, Cl. 290-40.00R.

Andersson, Roger Ingemar: *See—*
Amberntsson, Jan Roger; Andersson, Roger Ingemar; and Sultan, Stig Bertil, 4,095,237, Cl. 346-140.00R.

Andersson, Verner; and Jonason, Hans. Electrical energy supplied heat-emitting radiator. 4,095,088, Cl. 219-345.000.

Aniforms, Inc.: *See—*
Bunin, Morey, 4,094,092, Cl. 46-126.000.

Anizan, Pierre; Ducournau, Jean Paul; Gilberton, Paul; and Mevel, Yves, to Societe Francaise des Telephones Ericsson. Electronic telephone switching system of the stored program type comprising two active stages and one passive stage. 4,095,054, Cl. 179-18.0ES.

Anolick, Colin; Robinson, Vivian Marie; and Stewart, Charles Winfield, Sr., to Du Pont de Nemours, E. I., and Company. Upholstered furniture having improved flame resistance. 4,095,009, Cl. 428-310.000.

Anstalt Europaische Handelsgesellschaft: *See—*
Frutiger, Peter; and Gemperle, Bruno, 4,095,046, Cl. 178-22.000.

Aoki, Mitsugu; and Ishihara, Taketoshi, to Tokyo Kogaku Kikai Kabushiki Kaisha. Ophthalmic examination chart projector. 4,094,592, Cl. 351-30.000.

Aoyama, Shigeru: *See—*
Tanai, Kunio; Nakayama, Yasuaki; Hirai, Yoshiro; Aoyama, Shigeru; and Kashima, Yoshinobu, 4,095,129, Cl. 310-49.00R.

Aoyama, Tetsuo: *See—*
Mizuno, Kinichi; Saito, Masao; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, 4,094,905, Cl. 260-561.00R.

Applied Research Laboratories S.A.: *See—*
Danielsson, Nils Allan; and Lindblom, Karl-Peter Christian, 4,095,202, Cl. 335-213.000.

Arai, Sakuji: *See—*
Nakamura, Akihisa; Umemoto, Takashi; and Arai, Sakuji, 4,094,276, Cl. 123-52.00M.

Arai, Yuji: *See—*
Yoshimura, Masayoshi; Otsuki, Keizo; Shoji, Senji; Yamada, Tomio; Shimizu, Ichio; and Arai, Yuji, 4,095,253, Cl. 357-81.000.

Araya, Kumakichi; and Motoya, Junichi. Seal device in a roller chain. 4,094,515, Cl. 277-92.000.

Arendt, Hans F. Device for adding and/or removing fluid media in a rotating drum. 4,094,172, Cl. 68-58.000.

Argade, Shyam Dattatreya: *See—*
Balko, Edward Nicholas; and Argade, Shyam Dattatreya, 4,094,669, Cl. 75-108.000.

Arita, Shigeru: *See—*
Tani, Hirotsugu; Taguchi, Kyoji; and Arita, Shigeru, 4,095,217, Cl. 340-324.00R.

Ark-Les Switch Corporation: *See—*
LaScola, Anthony Rosario, 4,095,067, Cl. 200-67.0AA.

Armstrong, Derek: *See—*
Madsen, Peter Emil; Charlesworth, John Philip; and Armstrong, Derek, 4,094,060, Cl. 29-599.000.

Artt, Donald P. Elevator audible signaling device. 4,094,266, Cl. 116-64.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Takano, Hiroshi; Yoshino, Masatsugu; Naka, Hiroshi; Ito, Yoshinobu; and Matsushika, Tadao, 4,094,676, Cl. 96-90.00R.

Asbeck, Adolf: *See—*
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; Petzold, Manfred; and Uphues, Gunter, 4,094,812, Cl. 252-321.000.

Asea AB: *See—*
Danemar, Ake; Johansson, Arne; and Nerf, Owe, 4,095,264, Cl. 361-274.000.

Ash, Frank Robert: *See—*
Ash, Whewell Frank; and Ash, Frank Robert, 4,094,356, Cl. 165-39.000.

Ash, Whewell Frank; and Ash, Frank Robert. Geothermal heat recovery system. 4,094,356, Cl. 165-39.000.

Ashman, Stewart John, to Metallisation Limited. Electric arc metal spraying devices. 4,095,081, Cl. 219-76.160.

Ashworth, John Thomas: *See—*
Frazier, Thomas Cecil; Ashworth, John Thomas; Chumney, Richard Douglas, Jr.; and Meyre, Rene Wilhelm, 4,094,323, Cl. 131-8.00R.

Athenes, Claude; and Landez, Jean Pierre, to Thomson-CSF. Method of synchronizing a pulse code modulation (PCM) junction and an arrangement for applying this method. 4,095,048, Cl. 178-69.100.

Atkinson, Edward E.; and Queen, William E., to United States of America, Army. Random state generator. 4,095,192, Cl. 331-78.000.

Atlantic Richfield Company: *See—*
De Vries, Donald L.; and DeJovine, James M., 4,094,799, Cl. 252-29.000.

Atomic Energy of Canada Limited: *See—*
Schulson, Erland Maxwell; and Cameron, Donald James, 4,094,706, Cl. 148-11.50F.

Aucktor, Erich, to Lohr & Bromkamp GmbH. Seal for a universal joint. 4,094,517, Cl. 277-94.000.

Audibert, Francoise Marguerite: *See—*
Chedid, Louis A.; and Audibert, Francoise Marguerite, 4,094,971, Cl. 424-92.000.

Augst, Hans-Rudiger: *See—*
Daubenbuschel, Werner; Thomas, Alfred; Hess, Dieter; and Augst, Hans-Rudiger, 4,094,620, Cl. 425-140.000.

Auiler, James E.; Hamburg, Douglas R.; Hyland, James E.; and Moyer, David F., to Ford Motor Company. Vaporized liquid fuel delivery and metering system. 4,094,275, Cl. 123-34.00A.

Auletti, Ronald L.: *See—*
Salmond, William E.; and Auletti, Ronald L., 4,095,230, Cl. 343-729.000.

Austin, Arthur Lawrence; and Levis, William Walter, Jr., to BASF Wyandotte Corporation. Process for preparing halogenated aromatic hydroxy ethers. 4,094,910, Cl. 260-613.00B.

Austin Hoy and Company, Ltd.: *See—*
Harper, John A.; and Williams, Terence V., 4,094,611, Cl. 403-14.000.

Averette, Julius P., Jr.: *See—*
Harris, Rano J., Sr.; Harris, Rano J., Jr.; and Averette, Julius P., Jr., 4,094,197, Cl. 73-423.00A.

B F Kogyo Kaisha, Ltd. (Bi Efy Kogyo Kabushiki Kaisha): *See—*
Hirano, Itsuro, 4,094,784, Cl. 210-68.000.

B.S.G. International Limited: *See—*
Lafont, Raymond, 4,094,591, Cl. 350-289.000.

B.W.B. Controls, Inc.: *See—*
Bergeron, Ned A., 4,094,340, Cl. 137-625.660.

Babcock & Wilcox Company, The: *See—*
Christiansen, David Wayne, 4,094,558, Cl. 308-3.00R.

Back, Anthony Charles, to Crane Packing Limited. Shaft seals. 4,094,512, Cl. 277-27.000.

Back, Frank G., to Zoomar, Inc. Orbiter for pyroelectric focusing devices. 4,095,257, Cl. 358-113.000.

Baier, Walter: *See—*
von Pieverling, Klaus; Sepp, Hermann; and Baier, Walter, 4,095,047, Cl. 178-69.100.

Bailey, Charles H., to UOP Inc. Combination muffler and catalytic converter having low backpressure. 4,094,645, Cl. 23-288.0FC.

Bakardjiev, Stefan Todorov: *See—*
Malinovski, Yordan Petrov; Bakardjiev, Stefan Todorov; and Martinov, Georgi Mirchev, 4,094,269, Cl. 118-49.100.

Baldwin, Gary D.; and Bepko, Stephen J., to Westinghouse Electric Corp. Electro-optic modulator with compensation of thermally induced birefringence. 4,094,581, Cl. 350-150.000.

Balko, Edward Nicholas; and Argade, Shyam Dattatreya, to BASF Wyandotte Corporation. Polytetrafluoroethylene membrane filters for mercury recovery. 4,094,669, Cl. 75-108.000.

Ball, Donald H.; Rutledge, Robert W.; and Voelkers, James D., to Phillips Petroleum Company. Process measurement and control. 4,094,959, Cl. 423-359.000.

Ballentine, Earle W. Ceramic-glass burner. 4,094,297, Cl. 126-39.00J.

Baltimore Spice Company, The: *See—*
Stern, David L.; and Samchuck, Daniel B., 4,094,646, Cl. 23-230.00R.

Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., to Olinkraft, Inc. Combination shipping and storage container and method. 4,094,455, Cl. 229-15.000.

Bandoh, Tadaaki: *See—*
Kobayashi, Yoshiki; Bandoh, Tadaaki; Maejima, Hideo; and Yasuda, Hajime, 4,095,268, Cl. 364-200.000.

Barancok, Jozef: *See*—
Italy, Pavel; Kilik, Ondrej; Barancok, Jozef; and Miski, Anton, 4,094,144, Cl. 60-445.000.

Barasch, Kenneth S. Signalling device to be used with a sport implement for detecting and indicating the proper or improper use thereof. 4,094,504, Cl. 273-29.00A.

Barker, Alan Anthony: *See*—
Power, Ronald Frederick; Barker, Alan Anthony; Martin, Michael Charles; and Grover, Brian Clifford, 4,095,057, Cl. 179-175.10A.

Barnett, George Henry, to ICI Australia Limited. Stabilized nitratoalkanol explosive composition. 4,094,714, Cl. 149-88.000.

Barr, Irwin R., to AAI Corporation. Method of assembly of an insulating panel arrangement. 4,094,717, Cl. 156-197.000.

Barron, William F., to Raymond Lee Organization, Inc., The, a part interest. Football game. 4,094,509, Cl. 273-247.000.

Bartek, Joseph P.; and Grasselli, Robert K., to Standard Oil Company. Alkylation of aromatics using amphora shaped catalysts. 4,094,922, Cl. 260-671.00C.

BASF Aktiengesellschaft: *See*—
Mangold, Dietrich; Koenig, Karl-Heinz; and Reitel, Christian, 4,095,034, Cl. 560-134.000.

BASF Wyandotte Corporation: *See*—
Austin, Arthur Lawrence; and Levis, William Walter, Jr., 4,094,910, Cl. 260-613.00B.
Balko, Edward Nicholas; and Argade, Shyam Dattatreya, 4,094,669, Cl. 75-108.000.
Newkirk, David Dudley; Login, Robert Bernard; and Thir, Basil, 4,094,797, Cl. 252-8.900.

Baslow, Floyd M. Fixture for portable hair dryer. 4,094,076, Cl. 34-90.000.

Bastenhof, Dirk, to Societe d'Etudes de Machines Thermiques S.E.M.T. Method and device for obviating the risk of injection fuel leakage, more particularly into the cooling system of diesel engine injectors. 4,094,465, Cl. 239-132.300.

Batchelor, John Frederick: *See*—
Hodson, Harold Francis; and Batchelor, John Frederick, 4,094,968, Cl. 424-46.000.

Bates, Leslie Raymond; and Jenkins, John Michael, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Production of 5-nitrotetrazole salts. 4,094,879, Cl. 260-299.000.

Batzer, Othmer F.; and Ignoffo, Carlo M., to Sandoz, Inc. Pesticide compositions stabilized with sulfonated catechin/leucocyanidin copolymer and method of using same. 4,094,969, Cl. 424-78.000.

Baudin, Cecile; Miskovic, Mihajlo; Polton, Alain; and Sigwalt, Pierre, to Societe Chimique des Charbonnages. Grafting of vinylaromatic compounds by cationic polymerization on non-halogenated double-bonded chains. 4,094,830, Cl. 260-4.00R.

Bauer, Adolf: *See*—
Weber, Karl-Heinz; Bauer, Adolf; Danneberg, Peter; and Kuhn, Franz Josef, 4,094,984, Cl. 424-269.000.

Bauer, Donald J.; Eisele, Judith A.; and Eichbaum, Barlane R., to United States of America, Interior. Acid process for recovery of alumina from clay. 4,094,955, Cl. 423-123.000.

Bauer, Fritz: *See*—
Seeger, Karl; and Bauer, Fritz, 4,094,977, Cl. 424-240.000.

Bauer, William J. Constant rate float intake. 4,094,338, Cl. 137-578.000.

Bauerle, James E.; Reed, William H.; and Berkey, Edgar, to Westinghouse Electric Corp. Alkali metal ionization detector. 4,095,171, Cl. 324-33.000.

Baugesellschaft Klammt KG: *See*—
Dumont, Fritz, 4,094,156, Cl. 61-53.500.

Baxter, Donald C.: *See*—
Takefman, Bram A.; and Baxter, Donald C., 4,094,403, Cl. 206-45.130.

Bayer Aktiengesellschaft: *See*—
Behrenz, Wolfgang; Schapel, Dietmar; and Dahm, Manfred, 4,094,970, Cl. 424-78.000.
Knofel, Hartmut; and Ellendt, Gunther, 4,094,907, Cl. 260-570.00D.
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Sirrenberg, Wilhelm; Hammann, Ingeborg; Homeyer, Bernhard; and Thomas, Herbert, 4,094,975, Cl. 424-216.000.
Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, 4,094,852, Cl. 260-37.00N.
Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, 4,094,861, Cl. 260-47.00P.
Wenzel, Wolfgang; and Dieterich, Dieter, 4,094,842, Cl. 260-29.2TN.

BBC Brown, Boveri & Company Limited: *See*—
Pfenninger, Hans, 4,094,747, Cl. 202-173.000.
Woringer, Theo, 4,094,469, Cl. 239-405.000.

Beachem, Ronald; and Covington, Dennis, to Shaw, Leon O. Monitor and control system. 4,095,050, Cl. 179-2.00A.

Beagley, George. Portable adjustable outdoor cooking accessory. 4,094,296, Cl. 126-30.000.

Beall, Thomas E., Jr. Tennis racket. 4,094,505, Cl. 273-73.00C.

Bearden, Roby, Jr.; and Aldridge, Clyde L., to Exxon Research & Engineering Co. Coal liquefaction process. 4,094,765, Cl. 208-8.000.

Beaumont, Stanley. Process for sewage treatment with countercurrent heat transfer means. 4,094,773, Cl. 210-5.000.

Beavon, David K., to Ralph M. Parsons Company. Hydrogen sulfide production. 4,094,961, Cl. 423-564.000.

Becker, Carl; Wegmann, Jacques; and Schaub, Andres, to Ciba Geigy AG. Anionic and nonionic emulsified optical brightener suspension with a hydrotropic agent. 4,094,634, Cl. 8-1.00W.

Beeby, Philip J., to Syntex (U.S.A.) Inc. 3-Propenyl derivatives of cephalosporin, compositions and their use. 4,094,978, Cl. 424-246.000.

Beeman, Raymond; and Brajkovich, Steven J., to United States of America, Energy. Variable orifice using an iris shutter. 4,094,492, Cl. 251-212.000.

Begley, Richard F.; and Kurnit, Norman A., to United States of America, Energy. Resonantly enhanced four-wave mixing. 4,095,121, Cl. 307-88.300.

Behn, Reinhard; Loebl, Harald; and Preissinger, Karl-Heinz, to Siemens Aktiengesellschaft. Electrical LC resonant circuit. 4,095,199, Cl. 333-70.00R.

Behrenz, Wolfgang; Schapel, Dietmar; and Dahm, Manfred, to Bayer Aktiengesellschaft. Elastomeric polyurethane-based articles having an insecticidal depot gas action. 4,094,970, Cl. 424-78.000.

Behrman, Abraham S. Water purification means and method. 4,094,779, Cl. 210-40.000.

Beinglass, Israel: *See*—
Schieber, Michael M.; Beinglass, Israel; and Dishon, Giora, 4,094,268, Cl. 118-49.100.

Bell, Alexis T.: *See*—
United States of America, National Aeronautics and Space Administration; Sadhukhan, Pasupati; and Bell, Alexis T., 4,094,758, Cl. 204-164.000.

Bell Telephone Laboratories, Incorporated: *See*—
Boros, Victor Bert, 4,095,165, Cl. 323-17.000.
Ching, Yau-Chau; and Messerschmitt, David Gavin, 4,095,052, Cl. 179-15.0AS.
Cook, John Stone; and Sandahl, Carl Ragnar, 4,094,580, Cl. 350-96.210.
Crue, Charles R., 4,095,051, Cl. 179-15.0BS.
Damen, Theodoar Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, 4,095,122, Cl. 307-88.300.
Duttweiler, Donald Lars; and Hofmann, Allan Michael, 4,095,053, Cl. 179-15.0AF.
Ingle, Edwin Coy, 4,095,125, Cl. 307-234.000.
Seidel, Harold, 4,095,196, Cl. 332-16.00T.

Bell, Vernon L., to United States of America, National Aeronautics and Space Administration. Process for preparing thermoplastic aromatic polyimides. 4,094,862, Cl. 260-65.000.

Bellamy, Winthrop D., to General Electric Company. Production of ethanol from cellulose using a thermophilic mixed culture. 4,094,742, Cl. 195-33.000.

Belles, Wayne Stuart: *See*—
Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, 4,094,662, Cl. 71-92.000.

Bellouin, Francois C.; and Dremierre, Jean G., to Societe Nationale des Poudres et Explosifs. Apparatus for monitoring the application of a force to a solid body. 4,094,188, Cl. 73-81.000.

Bemmerl, Hans-Ferdinand: *See*—
Blumenthal, Gunter; Neu, Gustav; and Bemmerl, Hans-Ferdinand, 4,094,155, Cl. 61-45.00D.

Bemthin, Johannes, to MFB Neuwerk GmbH. Bottom douche for flush toilets. 4,094,018, Cl. 4-7.000.

Benjamin, Thomas A., to IPCO Hospital Supply Corporation. Grounding cable clip. 4,094,571, Cl. 339-91.00R.

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Bertus, Brent J., to Phillips Petroleum Company. Catalyst and process for oxidative dehydrogenation. 4,094,819, Cl. 252-435.000.

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Johnson, William C., 4,094,837, Cl. 260-22.00A.

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Kunzmann, Otto, 4,094,500, Cl. 270-79.000.

Biggs, Herbert W. Electrically powered vehicle. 4,094,377, Cl. 180-65.00C.

Bindernagel, Ali, to Friedrich Kocks GmbH. Casting rolling mill for wire. 4,094,049, Cl. 29-33.00C.

Bindicator Company: *See—*
Fleckenstein, Paul P., 4,095,064, Cl. 200-61.210.

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Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Knauft, Guenter; Richter, Stephan; and Schulze-Schoelling, Hermann, to International Business Machines Corporation. Method of implementing manual operations. 4,095,270, Cl. 364-200.000.

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Blytas, George C., to Shell Oil Company. Heat recovery process. 4,094,355, Cl. 165-1.000.

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Marquez, Bernard James, 4,094,972, Cl. 424-105.000.

Boback, Torsten: *See—*
Waenerlund, Lars; and Boback, Torsten, 4,095,078, Cl. 219-68.000.

Boccia, Salvatore, to Minigrip, Inc. Apparatus for making open profile bags. 4,094,729, Cl. 156-515.000.

Bocharova, Svetlana Leonidovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

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Bodor, Nicholas S., to Interx Research Corporation. Method for reducing intraocular pressure in warm-blooded animals. 4,094,983, Cl. 424-266.000.

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Steinberger, David I., 4,094,379, Cl. 181-284.000.

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Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Frolke, Wilhelm, 4,094,980, Cl. 424-250.000.
Weber, Karl-Heinz; Bauer, Adolf; Danneberg, Peter; and Kuhn, Franz Josef, 4,094,984, Cl. 424-269.000.

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Bogdanov, Alexandr Andreevich: *See—*
Kolpakov, Serafim Vasilievich; Gurkov, Zinovy Lvovich; Bondarenko, Oleg Leonidovich; Valtsov, Vladimir Viktorovich; Pozhivanov, Alexandr Mikhailovich; Gugnin, Eduard Dmitrievich; Radilov, Stanislav Vyacheslavovich; and Bogdanov, Alexandr Andreevich, 4,094,938, Cl. 264-30.000.

Bogos, Constantin: *See—*
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Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, to Hoffmann-La Roche Inc. Optically active cyclohexane derivatives. 4,095,038, Cl. 560-255.000.

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Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

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Booty, William Michael, to Neptume Microfloc, Inc. Suction clarifier method. 4,094,785, Cl. 210-70.000.

Borbonus, Gerhard: *See—*
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Cohen, Murray S.; and O'Connell, Donald E., 4,094,999, Cl. 426-547.000.
Exline, Roger Edsel, 4,094,217, Cl. 83-6.000.
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Yannopoulos, John C.; and Borham, Borham M., 4,094,668, Cl. 75-99.000.

Borisov, Vladimir Alexeevich; Akhmedzhanov, Ravil Abdrakhmanovich; and Chistyakov, Jury Vsevolodovich. Device for automatic dimension control of extruded blanks. 4,095,156, Cl. 318-571.000.

Boros, Victor Bert, to Bell Telephone Laboratories, Incorporated. Switching regulator control utilizing digital comparison techniques to pulse width modulate conduction through a switching device. 4,095,165, Cl. 323-17.000.

Borsum, Dietrich: *See—*
Richter, Erhard; and Borsum, Dietrich, 4,094,511, Cl. 274-39.00A.

Bose, Phillip R., to Chevron Research Company. Process for removing unfilterable solids from an oil. 4,094,770, Cl. 208-251.00R.

Bosman Industries, Inc.: *See—*
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Botta, Artur; von Konig, Anita; Moll, Franz; Rasp, Christian; and Hartl, Johannes, to Agfa-Gevaert Aktiengesellschaft. Process for the

preparation of silver dispersions for filter layers and antihalation layers. 4,094,811, Cl. 252-313.00R.
Boucher, Bernard; Luzet, Daniel; and Sella, Claude, to Commissariat a l'Energie Atomique; and Agence Nationale de Valorisation de la Recherche (ANVAR). Device for cathodic sputtering at a high deposition rate. 4,094,764, Cl. 204-298.000.
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Castaigne, Francois; Boulet, Marcel; Riel, Rene R.; and Liber, Eric, 4,094,235, Cl. 99-450.100.
Bowers, Lewis H.; Jankowski, Raymond E.; and Sullivan, John L., to Schenectady Chemicals, Inc. ABS-formaldehyde novolak. 4,094,834, Cl. 260-19.0UA.
Bowman, Raymond D.: *See—*
Camp, Vernon D.; and Bowman, Raymond D., 4,094,398, Cl. 194-10.000.
Boyars, Carl; and Kamlet, Mortimer J., to United States of America, Navy. Explosive composition containing guanidinium picrate. 4,094,710, Cl. 149-3.000.
Boyd, William Weller: *See—*
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Boyhont, Donald S.; and Warshawsky, Jay, to Fuller Company. Apparatus for producing cement clinker. 4,094,626, Cl. 432-58.000.
Bracken, Robert L., to Sundstrand Corporation. Variable output centrifugal pump. 4,094,613, Cl. 415-17.000.
Bradley, Marion W., to Farinon Electric. Combined wire cutter and insulation remover. 4,094,213, Cl. 81-9.50R.
Bradley, Marion W., to Farinon Electric. Wire insulation stripping device. 4,094,214, Cl. 81-9.50R.
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, to Glaxo Laboratories Limited. 3-Carbamoyloxymethyl or N-methyl-carbamoyloxymethyl-7-[2-carboxymethoxyimino-2-(fur-2-yl or thien-2-yl)acetamido]ceph-3-em-4-carboxylic acids and derivatives thereof. 4,095,021, Cl. 544-22.000.
Brajkovich, Steven J.: *See—*
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Brandelli, Anthony R. Fluid control device. 4,094,327, Cl. 137-403.000.
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for preparation of a sprayable precipitated silicic acid suspension. 4,094,771, Cl. 209-4.000.
Braun, Ernst; and Braun, Gert, to Halbach & Braun. Conveyor for conveying fine material. 4,094,400, Cl. 198-607.000.
Braun, Gert: *See—*
Braun, Ernst; and Braun, Gert, 4,094,400, Cl. 198-607.000.
Braun, Rolf, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Device for adjusting form rollers providing automatic compensation for change in packing thickness. 4,094,243, Cl. 101-349.000.
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Bremer, Wolfgang; Heintz, Frieder; Flaig, Ulrich; Kiencke, Uwe; and Glauert, Wolfram, to Robert Bosch GmbH. Locating system to determine the position of movable bodies with respect to a reference. 4,095,179, Cl. 324-207.000.
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., to Texaco Development Corporation. Production of bis-(morpholino-N-alkyl) ethers. 4,095,022, Cl. 544-87.000.
Brenner, Max, to Brenner, Max. Protein-saving foodstuff and fodder additive. 4,095,000, Cl. 426-656.000.
Breslow, B. Arthur, to United States of America, Navy. Sensitizing liquid explosives with high gamma gas. 4,094,713, Cl. 149-36.000.
Bridges, Ronald P. Group operated circuit disconnect apparatus for overhead electric power lines. 4,095,061, Cl. 200-48.0KB.
Bridgestone Tire Company Limited: *See—*
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Brieaddy, Lawrence Edward: *See—*
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British Leyland UK Limited: *See—*
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British Petroleum Company Limited, The: *See—*
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Britton, Thomas C.: *See—*
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Brix, Hermann Josef; and Wienand, Hans-Jurgen, to Girling Limited. Disc brakes. 4,094,389, Cl. 188-73.300.
Broder, Gerhard, to Franz Berrenberg. Method of heat forming of workpieces. 4,094,048, Cl. 29-6.000.
Brookes, Malcolm J.: *See—*
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Brooks, John Langshaw; and Budziarek, Richard, to Imperial Chemical Industries Limited. Cross-linking hydrocarbon unsaturated polymer with mono-sulphonyloxycarbamate compounds. 4,094,863, Cl. 260-77.50B.
Brooks, Ronald Robert; and Wojslawowicz, Jack Edward, to RCA Corporation. Direction reversing direct current motors and their control. 4,095,155, Cl. 318-541.000.
Brown Company: *See—*
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Brown, George J. Data viewer. 4,094,589, Cl. 350-241.000.
Brown, Gordon Ralph, to K. J. Law Engineers, Inc. Method and apparatus for testing conductivity using eddy currents. 4,095,180, Cl. 324-233.000.
Brown, Harold, to Mineral Concentrates & Chemical Company, Inc. Method and apparatus for retorting oil shale. 4,094,769, Cl. 208-11.00R.
Brown, Jack H. Vehicle lock. 4,094,173, Cl. 70-237.000.
Brown, Jeannette E.: *See—*
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Brown, Marion L.: *See—*
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Brown, Vicki Suzanne, administrator: *See—*
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Brunner, Fritz R.: *See—*
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Bruno, Roberto; and Faccenda, Valerio, to Italsider S.p.A. Weathering steel with high toughness. 4,094,670, Cl. 75-124.000.
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Brutsman, James W., to Wyott Corporation. Heated dispenser for hot toppings and the like. 4,094,446, Cl. 222-146.0HE.
Bryant, Neil. Hanger for tennis rackets. 4,094,488, Cl. 248-359.000.
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Bugaut, Andree; and Fourcadier, Chantal S., to L'Oreal. Meta-aminophenol sulfonamides as couplers in hair dye compositions. 4,094,635, Cl. 8-11.000.
Buhler-Miag GmbH: *See—*
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Bunch, Laverne R., to CGR Medical Corporation. Means for stepping X-ray receptor in direction opposite to position change of source. 4,095,110, Cl. 250-445.00T.
Bunin, Morey, to Aniforms, Inc. Two dimensional animated character. 4,094,092, Cl. 46-126.000.
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Burcham, Gerald C. Detachable wall mounting system. 4,094,114, Cl. 52-489.000.
Burger, Thomas J., to Minnesota Mining and Manufacturing Company. Reusable solar control film and method of making. 4,095,013, Cl. 428-522.000.
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Burke, George K.; LeFevre, Robert J.; and Thomas, Robert E., to Burron Medical Products, Inc. Electronic control means for a plurality of intravenous infusion sets. 4,094,318, Cl. 128-214.00E.
Burnett, Edward D. Illusion apparatus. 4,094,501, Cl. 272-8.00M.
Burr, Robert Page; Morino, Ronald; and Keogh, Raymond J., to Kollmorgen Technologies, Inc. Multi-wire electrical interconnecting member having a multi-wire matrix of insulated wires mechanically terminated thereon. 4,094,572, Cl. 339-97.00P.
Burris, Michael V. Asphalt emulsion paving composition. 4,094,696, Cl. 106-277.000.
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Hodson, Harold Francis; and Batchelor, John Frederick, 4,094,968, Cl. 424-46.000.
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Bury, John R. Treatment control apparatus for water systems. 4,094,786, Cl. 210-101.000.
Busch, Richard E., to Addmaster Corporation. Mounting device. 4,094,483, Cl. 248-73.000.
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Byrne, Peter Cyril; and Moore, Desmond F., to PCB Controls Ltd. Anti-skid control method and apparatus for a brake-equipped vehicle wheel. 4,094,555, Cl. 303-100.000.
C.G.R. MeV: *See—*
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Simpson, Kenneth A., 4,095,070, Cl. 200-153.00J.
Cabagnero, Ramon Jane, to Jane, S.A. Foldable stroller for children. 4,094,531, Cl. 280-649.000.
Cabot Corporation: *See—*
Rostler, Fritz S., 4,094,697, Cl. 106-280.000.
Cacolici, Santo J., to A P Products Incorporated. Multiple conductor electrical connector with ground bus. 4,094,564, Cl. 339-14.00L.
Cairnes, Denis Alan; and Maltby, Derrick John, to Cairnes Maltby Associates Limited. Shelving and display systems and the like. 4,094,417, Cl. 211-183.000.
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Cairnes, Denis Alan; and Maltby, Derrick John, 4,094,417, Cl. 211-183.000.
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Scanga, Theodore P.; and Callender, Robert E., 4,094,460, Cl. 229-43.000.
Cameron, Donald James: *See—*
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Lamb, George D., 4,094,126, Cl. 53-35.000.
Camp, Vernon D.; and Bowman, Raymond D., to Cavalier Corporation. Composite vending circuit disposable in single- and multiple-priced configurations. 4,094,398, Cl. 194-10.000.
Campbell, John Edward; and Thompson, Gerhard Robert, to International Business Machines Corporation. First in-first out memory array containing special bits for replacement addressing. 4,095,283, Cl. 365-230.000.
Campbell, John Scott: *See—*
Kolker, Carl R.; Campbell, John Scott; La Fond, Robert L.; and Smith, JaMi, 4,095,248, Cl. 358-288.000.
Campbell Soup Company: *See—*
Hildebolt, William M.; and Hundt, Murray T., 4,095,001, Cl. 426-656.000.
Camphausen, Don L., to Xerox Corporation. Xerographic system employing waveguide addressing and modulating apparatus. 4,094,606, Cl. 355-3.00R.
Campioni, Armando, to Indesit Industria Elettrodomestici Italiana S.p.A. Differential gain error correction in color television systems. 4,095,256, Cl. 358-35.000.
Cannarozzo, Pedro Nicolas. Perpetual calendar. 4,094,082, Cl. 40-107.000.
Canon Kabushiki Kaisha: *See—*
Matsumoto, Seiichi, 4,095,241, Cl. 354-31.000.
Nakamura, Zenzo, 4,095,141, Cl. 315-241.00P.
Sato, Yasuhisa; Tsuji, Sadahiko; and Tanaka, Katsumi, 4,094,586, Cl. 350-184.000.
Tsunekawa, Tokuichi; Uchidoi, Masanori; Nakamura, Zenzo; Taguchi, Tetsuya; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,095,242, Cl. 354-33.000.
Carl Zeiss-Stiftung: *See—*
Kutscherauer, Andreas; and Muller, Ortwin, 4,094,593, Cl. 351-38.000.
Carlile, Alfred E. Shoe fastener. 4,094,029, Cl. 12-113.000.
Carlson, Arthur W., to Velsicol Chemical Corporation. Process for the preparation of 2,5-dichlorophenol. 4,094,913, Cl. 568-778.000.
Carlson, Bayard L., to Amfac Foods, Inc. Method and apparatus for the alignment of elongated articles. 4,094,123, Cl. 53-24.000.
Carlsson, Gunilla A. Snap shackle. 4,094,047, Cl. 24-241.00R.
Carmi, Arieh; Chang, Zung S.; and Rayeski, Thomas J., to Corning Glass Works. Glass pressing plunger cooling. 4,094,657, Cl. 65-83.000.
Carpenter, Jerry W. Fishing lure and hook. 4,094,087, Cl. 43-42.240.
Carr, Paul, to Flo-Tork, Inc. Rotary actuator and methods of fabrication. 4,094,231, Cl. 92-128.000.
Carrier Corporation: *See—*
Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., 4,094,424, Cl. 214-304.000.
Carrock, Frederick Elias; Perron, Peter James; and Zukowski, Edward August, to Dart Industries, Inc. Process for the polymerization of α-olefins. 4,095,016, Cl. 526-137.000.
Carroll, Mathew Ralph. Skate board braking and steering system. 4,094,524, Cl. 280-11.200.
Carter, Larry D., to True Temper Corporation. Base station antenna. 4,095,231, Cl. 343-846.000.
Carubia, Giovanni; Papa, Roberto; and Pratelli, Cesare, to Societa Italiana Telecomunicazioni Siemens S.p.A. Data-processing system with a set of peripheral units repetitively scanned by a common control unit. 4,095,266, Cl. 364-200.000.
Caruso, Peter M. Systems for drying particulate material. 4,094,075, Cl. 34-72.000.
Casey, Donald James: *See—*
Huffman, Kenneth Robert; Casey, Donald James; and Thomas, Walter Moreland, 4,094,847, Cl. 260-29.40R.
Castaigne, Francois; Boulet, Marcel; Riel, Rene R.; and Liber, Eric, to Universite Laval. Apparatus for the production of textured products. 4,094,235, Cl. 99-450.100.
Castcraft Industries, Inc.: *See—*
Frazier, Clifford John, 4,094,680, Cl. 96-41.000.
Catalucci, Enrico, to Lonza, Ltd. Process for the production of 2-amino-4-hydroxy-6-methylpteridine. 4,094,874, Cl. 544-258.000.
Catenaccio, Frank. Laundry bag. 4,094,351, Cl. 150-7.000.
Caterpillar Tractor Co.: *See—*
Chamberlain, Richard W., 4,095,071, Cl. 200-157.000.
Habiger, Cyril W., 4,094,145, Cl. 60-447.000.
Schexnayder, Lawrence F., 4,094,228, Cl. 91-411.00B.
Van Rossem, Richard; and Hyde, Michael B., 4,094,209, Cl. 74-543.000.
Cauley, John F. Cargo container. 4,094,430, Cl. 220-1.500.
Cavalier Corporation: *See—*
Camp, Vernon D.; and Bowman, Raymond D., 4,094,398, Cl. 194-10.000.
Cavigelli, George A.: *See—*
McEachern, Robert A.; and Cavigelli, George A., 4,094,310, Cl. 128-2.06G.
Cedro, Vito, III; Kinosz, Donald L.; and Lamberti, Thomas G., II, to Aluminum Company of America. Regeneration of activated carbon having materials adsorbed thereon. 4,094,815, Cl. 252-415.000.
Celanese Corporation: *See—*
DeMartino, Ronald N.; and Conciatori, Anthony B., 4,094,795, Cl. 252-8.55R.
Cellini, Alfonso J. Cleaning apparatus for selected small areas of a swimming pool. 4,094,031, Cl. 15-1.700.
Cessna Aircraft Company, The: *See—*
Vesel, Andrew M., 4,095,186, Cl. 328-133.000.
CGR Medical Corporation: *See—*
Bunch, Laverne R., 4,095,110, Cl. 250-445.00T.
Cha, Charles L., to Mead Corporation, The. Apparatus for producing multiple uniform fluid filaments and drops. 4,095,232, Cl. 346-75.000.
Chamberlain, Richard W., to Caterpillar Tractor Co. Switch mounted in a lever handle. 4,095,071, Cl. 200-157.000.
Champion International Corporation: *See—*
Navarre, Anatole Joseph, Jr., 4,094,187, Cl. 73-1.00G.
Raccaforte, Harry I., 4,094,456, Cl. 229-17.0SC.
Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. 6(6-Substituted-2,5,7,8-tetramethyl-2-chromanyl)-3-methyl-4-hexenoic acid derivatives. 4,094,885, Cl. 260-345.500.
Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Process for preparing optically active esters. 4,094,892, Cl. 260-410.90R.
Chandalia, Kiran B.; and Preston, Frank J., to Olin Corporation. Azo di-ester polyols for graft copolymerization. 4,094,868, Cl. 260-192.000.
Chang, Eugene Yue Chieh, to American Cyanamid Company. Process for the preparation of copolymers of thiodiethanol using a phosphorous acid-metal sulfate catalyst. 4,094,859, Cl. 260-47.00R.
Chang, Zung S.: *See—*
Carmi, Arieh; Chang, Zung S.; and Rayeski, Thomas J., 4,094,657, Cl. 65-83.000.
Chas. O. Larson Co.: *See—*
Larson, Charles O., 4,094,415, Cl. 211-57.100.
Charles Stark Draper Laboratory, Inc., The: *See—*
Watson, Paul C.; and Drake, Samuel H., 4,094,192, Cl. 73-133.00R.
Charlesworth, John Philip: *See—*
Madsen, Peter Emil; Charlesworth, John Philip; and Armstrong, Derek, 4,094,060, Cl. 29-599.000.
Charlton, Thomas L.; and Redden, Robert F., to Cominco Ltd. Recovery of gallium from gallium compounds. 4,094,753, Cl. 204-105.00R.
Chedid, Louis A.; and Audibert, Francoise Marguerite, to Agence Nationale de Valorisation de la Recherche. Immunological adjuvant agents active in aqueous solution. 4,094,971, Cl. 424-92.000.
Chem-E-Watt Corporation: *See—*
Kober, Frederick P., 4,094,298, Cl. 126-263.000.
Chemineer, Inc.: *See—*
Kime, Donald L.; and Stogdill, Ronald G., 4,094,513, Cl. 277-41.000.
Chemische Werke Huels Aktiengesellschaft: *See—*
Knepper, Wilhelm; and Mueller, Dieter Juergen, 4,094,898, Cl. 260-513.00B.
Kuepper, Friedrich-Wilhelm, 4,095,033, Cl. 526-90.000.
Chetelat, Fernand; and Hersberger, Pierre, to Ebauches S.A. Electronic chronograph. 4,094,138, Cl. 58-39.500.
Chevron Research Company: *See—*
Bose, Phillip R., 4,094,770, Cl. 208-251.00R.
Straus, Alan E., 4,094,888, Cl. 260-346.750.
Tanquary, A. Charles, 4,094,945, Cl. 264-184.000.
Chicago Rawhide Manufacturing Company: *See—*
Heyn, William O.; and Peisker, Glenn W., 4,094,519, Cl. 277-134.000.
Johnson, Donald L., 4,094,514, Cl. 277-92.000.
Morley, James P.; and Woods, William J., 4,094,516, Cl. 277-92.000.
Ching, Yau-Chau; and Messerschmitt, David Gavin, to Bell Telephone Laboratories, Incorporated. Digital speech interpolation trunk priority rotator. 4,095,052, Cl. 179-15.0AS.
Chistyakov, Jury Vsevolodovich: *See—*
Borisov, Vladimir Alexeevich; Akhmedzhanov, Ravil Abdrakhmanovich; and Chistyakov, Jury Vsevolodovich, 4,095,156, Cl. 318-571.000.
Chiyoda Chemical Engineering & Construction Co., Ltd.: *See—*
Kobayashi, Hiroshi; and Kuwabara, Nobuyoshi, 4,094,380, Cl. 181-285.000.

Chokai, Shoichi: *See*—
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,094,991, Cl. 424-309.000.

Chombard, Pierre Andre, to Societe Francaise d'Equipements pour la Navigation Aerienne S.F.E.N.A. Method and equipment for making roll and pitch data inputs into a piloting instrument. 4,094,200, Cl. 74-5.00R.

Chou, Eddie C. J.: *See*—
Symens, Raymond D.; Queneau, Paul B.; Chou, Eddie C. J.; and Clark, Franklin F., 4,094,754, Cl. 204-108.000.

Christiansen, David Wayne, to Babcock & Wilcox Company, The. Locking nut assembly with deformable locking sleeve. 4,094,558, Cl. 308-3.00R.

Chubb, Walston, to Westinghouse Electric Corp. Nuclear fuel pellet design to minimize dimensional changes. 4,094,738, Cl. 176-67.000.

Chumney, Richard Douglas, Jr.: *See*—
Frazier, Thomas Cecil; Ashworth, John Thomas; Chumney, Richard Douglas, Jr.; and Meyre, Rene Wilhelm, 4,094,323, Cl. 131-8.00R.

Chvala, William James: *See*—
Clarke, Richard Allen; Chvala, William James; and DeWitte, Raymond Edward, 4,094,526, Cl. 280-47.350.

Ciba Geigy AG: *See*—
Becker, Carl; Wegmann, Jacques; and Schaub, Andres, 4,094,634, Cl. 8-1.00W.

Ciba-Geigy Corporation: *See*—
Hubele, Adolf, 4,094,990, Cl. 424-285.000.
Karrer, Friedrich, 4,094,989, Cl. 424-282.000.
Karrer, Friedrich; and Farooq, Saleem, 4,094,993, Cl. 424-337.000.
Miller, Ralph, 4,094,958, Cl. 423-238.000.
Nachbur, Hermann; and Rohringer, Peter, 4,094,929, Cl. 260-968.000.
Riegler, Albert; Saar, Werner; and Wiese, Volkhard, 4,094,839, Cl. 260-23.00R.
Spivack, John D., 4,094,855, Cl. 260-45.8NT.

Citizen Watch Company Limited: *See*—
Morokawa, Shigeru, 4,094,137, Cl. 58-23.00A.
Nomura, Yasushi; and Morokawa, Shigeru, 4,094,135, Cl. 58-23.00R.
Nomura, Yasushi; and Nishikubo, Yasuhiko, 4,094,139, Cl. 58-50.00R.
Tanai, Kunio; Nakayama, Yasuaki; Hirai, Yoshiro; Aoyama, Shigeru; and Kashima, Yoshinobu, 4,095,129, Cl. 310-49.00R.

Clark, Franklin F.: *See*—
Symens, Raymond D.; Queneau, Paul B.; Chou, Eddie C. J.; and Clark, Franklin F., 4,094,754, Cl. 204-108.000.

Clark, George L., to TRW Inc. Broadband gas laser. 4,095,193, Cl. 331-94.50G.

Clark, Robert Tilden: *See*—
Oldham, Frederick, 4,094,950, Cl. 264-259.000.

Clarke, Richard Allen; Chvala, William James; and DeWitte, Raymond Edward, to PepsiCo, Inc. Portable display vehicle. 4,094,526, Cl. 280-47.350.

Clarke, William J., to American Cyanamid Company. Composition of matter useful for earthen formation treatment. 4,094,150, Cl. 61-36.00C.

Clayson N.V.: *See*—
Decoene, Frans J. G. C.; Muijs, Cornelis G. M.; Van Eecke, Roger H.; and Vansteelant, Marc G., 4,094,132, Cl. 56-14.400.

Clayton, Richard William: *See*—
Hayden, Percy; and Clayton, Richard William, 4,094,889, Cl. 260-348.340.

Clelland, David Watson, to United Kingdom Atomic Energy Authority. Method for the storage of material. 4,094,762, Cl. 204-192.0EC.

Cline, James C.: *See*—
Keyser, Naaman H.; and Cline, James C., 4,094,731, Cl. 156-616.00R.

Cloud, Don L., to I.I.C., Inc. Method and apparatus for producing composite film images for identification. 4,094,597, Cl. 353-35.000.

Cluzel, John Michael. Ski structure. 4,094,528, Cl. 280-610.000.

Coats & Clark, Inc.: *See*—
Einhorn, Ruediger, 4,094,490, Cl. 248-489.000.

Cocuzza, Gioacchino; and Musso, Giuseppe, to Societa' Italiana Resine S.I.R. S.p.A. Process for producing hydrogen and sulfur from hydrogen sulfide. 4,094,962, Cl. 423-573.00R.

Cohen, Jerome B.; and James, Michael R., to Northwestern University. Apparatus and method for determination of residual stress in crystalline substances. 4,095,103, Cl. 250-277.0CH.

Cohen, Murray S.; and O'Connell, Donald E., to Borg-Warner Corporation. Antioxidant for foods. 4,094,999, Cl. 426-547.000.

Coiner, William A. Disposable container for heatable food products. 4,094,434, Cl. 220-90.600.

Coker, J. O. Tensioning device for tightening and securing a holding strap. 4,094,044, Cl. 24-68.0CD.

Colchagoff, Robert D.; Fortner, Paul W.; Kirkman, Richard T.; Naughton, Thomas J.; and Zimmerman, George, to Owens-Illinois, Inc. Method for forming glass containers. 4,094,656, Cl. 65-81.000.

Cole, Judson C.; and Morain, Eldon W., to Continental Industries, Inc. Meter riser. 4,094,536, Cl. 285-21.000.

Collin, Per Harald; and Widell, Bjorn, to Stora Kopparbergs Bergslags AB. Method for simultaneous combined production of electrical energy and crude iron. 4,094,665, Cl. 75-11.000.

Collins, Joseph Martin, to Burroughs Corporation. Sheet splicer. 4,094,727, Cl. 156-505.000.

Combustion Engineering, Inc.: *See*—
Turner, James Franklin, 4,094,630, Cl. 432-134.000.

Cominco Ltd.: *See*—
Charlton, Thomas L.; and Redden, Robert F., 4,094,753, Cl. 204-105.00R.

Commissariat a l'Energie Atomique: *See*—
Alleau, Thierry; and Moracchioli, Robert, 4,094,147, Cl. 60-641.000.
Blanc, Raymond; and Jacquelin, Roland, 4,094,369, Cl. 177-147.000.
Boucher, Bernard; Luzet, Daniel; and Sella, Claude, 4,094,764, Cl. 204-298.000.

Commonwealth of Australia, c/o The Department of Health, The: *See*—
Kossoff, George, 4,094,306, Cl. 128-2.00V.

Communication Mfg. Company: *See*—
O'Dea, Orrin Bernard, 4,095,058, Cl. 179-175.20D.

Compagnie Industrielle des Telecommunications Cit-Alcatel S.A.: *See*—
Le Coz, Gerard; and Marchalot, Jean-Noel, 4,095,197, Cl. 333-28.00R.

Conciatori, Anthony B.: *See*—
DeMartino, Ronald N.; and Conciatori, Anthony B., 4,094,795, Cl. 252-8.55R.

Connelly, Gerald Aloysius: *See*—
Anderson, Elvin Lowell; and Connelly, Gerald Aloysius, 4,094,900, Cl. 260-520.00E.

Conrad Scholtz AG: *See*—
Heeke, Hugo, 4,094,402, Cl. 198-847.000.

Conrad, Ulrich, to Daimler-Benz Aktiengesellschaft. Lubricating oil filter with an upright filter pot. 4,094,791, Cl. 210-316.000.

Consolidated Packaging Corporation: *See*—
Spillson, George A., 4,094,457, Cl. 229-21.000.

Conte, Ronald L.: *See*—
Protano, Dominic R.; and Conte, Ronald L., 4,094,022, Cl. 4-172.170.

Continental Group, Inc., The: *See*—
Nelson, Bennie Charles, Jr., 4,094,458, Cl. 229-39.00R.

Continental Industries, Inc.: *See*—
Cole, Judson C.; and Morain, Eldon W., 4,094,536, Cl. 285-21.000.

Continental Oil Company: *See*—
Gorin, Everett, 4,094,766, Cl. 208-10.000.

Control Concepts Corporation: *See*—
Montague, Herbert R., 4,095,163, Cl. 323-8.000.

Cook, Arthur W. Skipping exercise device. 4,094,502, Cl. 272-74.000.

Cook, Charles Edward, to Deere & Company. Combined belt and hydrostatic vehicle drive. 4,094,205, Cl. 74-242.1FP.

Cook, John Stone; and Sandahl, Carl Ragnar, to Bell Telephone Laboratories, Incorporated. Hermaphrodite optical fiber connector. 4,094,580, Cl. 350-96.210.

Cook, Lloyd A.; Reynolds, Kim A.; and Mark, Werner J., to Alforge Metals Corporation, Limited. Method for pressure welding metal workpieces. 4,094,453, Cl. 228-265.000.

Cook, Martin Christopher: *See*—
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,095,021, Cl. 544-22.000.

Cook, Toby M.; Tucker, Gerald L.; and Brown, Marion L., to Mississippi Chemical Corporation. Ammonium nitrate neutralizer. 4,094,643, Cl. 23-285.000.

Cookson, Alan H., to Westinghouse Electric Corp. Gas insulated transmission line having low inductance intercalated sheath. 4,095,040, Cl. 174-28.000.

Coons, Everett A., to Olinkraft, Inc. Container with easy tuck-under flap for overlapping closure and method. 4,094,459, Cl. 229-41.00B.

Cope, Louis T., to H & T Enterprises, Inc. Method and apparatus for reducing the temperature of a fluid. 4,094,164, Cl. 62-74.000.

Cope, Raymond. Dental instrument retraction device. 4,094,069, Cl. 32-22.000.

Cormier Cardiac Systems, Inc.: *See*—
Cormier, Denny Charles, 4,094,308, Cl. 128-2.05R.

Cormier, Denny Charles, to Cormier Cardiac Systems, Inc. Method and system for rapid non-invasive determination of the systolic time intervals. 4,094,308, Cl. 128-2.05R.

Cornell Research Foundation: *See*—
Williams, Gregory J., 4,094,703, Cl. 136-89.0TF.

Cornell Research Foundation, Inc.: *See*—
Alexander, Martin; and Odeyemi, Oluwasuyi, 4,094,097, Cl. 47-57.600.
Saxena, Brij B., 4,094,963, Cl. 424-1.000.

Cornils, Boy: *See*—
Rottig, Walter; Tummes, Hans; Cornils, Boy; and Weber, Jurgen, 4,094,914, Cl. 568-862.000.

Corning Glass Works: *See*—
Carmi, Arieh; Chang, Zung S.; and Rayeski, Thomas J., 4,094,657, Cl. 65-83.000.

Cory Food Services, Inc.: *See*—
Schlegel, Norman H.; and Karlen, Harvey R., 4,094,449, Cl. 222-475.000.

Courtaulds Limited: *See*—
Robinson, Frank, 4,094,171, Cl. 66-176.000.

Courtlandt Boot Jack Co., Ltd.: *See*—
Parlante, Frank; and Parlante, Henry, 4,094,450, Cl. 224-2.00B.

Covington, Dennis: *See*—
Beachem, Ronald; and Covington, Dennis, 4,095,050, Cl. 179-2.00A.

Cox, Jack Jebson, to Flavell Proprietary Limited. Shaft seal. 4,094,518, Cl. 277-95.000.

Crane Packing Limited: *See—*
Back, Anthony Charles, 4,094,512, Cl. 277-27.000.

Creegan, Patrick J. Structural steel building frame having resilient connectors. 4,094,111, Cl. 52-167.000.

Creusot-Loire: *See—*
Malbrunot, Pierre, 4,095,285, Cl. 366-23.000.

Crounse, Nathan N.; and Schmidt, Paul J., to Sterling Drug Inc. Tri- or tetrasubstituted diphenylphthalides. 4,094,877, Cl. 260-293.580.

Crouse, William George, to International Business Machines Corporation. Hybrid pulse width-pulse rate digital-to-analog converter method and apparatus. 4,095,218, Cl. 340-347.0DA.

Crow, Arthur F., Jr. Method and apparatus for converting an agriculture machine to a tractor. 4,094,373, Cl. 180-1.00F.

Crucible Inc.: *See—*
Fleck, James N.; Palmer, Richard C.; and Ruffner, Charles L., 4,094,672, Cl. 75-226.000.

Crue, Charles R., to Bell Telephone Laboratories, Incorporated. Demultiplexer circuit. 4,095,051, Cl. 179-15.0BS.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.P.A.: *See—*
DiVita, Pietro; and Vannucci, Riccardo, 4,094,578, Cl. 350-96.150.

CTS Corporation: *See—*
Wiswell, H. Eugene; and Hardwick, Danny R., 4,095,209, Cl. 338-174.000.

Cutler-Hammer, Inc.: *See—*
Piber, Earl T., 4,095,072, Cl. 200-157.000.

Cybernet Electronic Corporation: *See—*
Kakigi, Takao, 4,095,182, Cl. 325-17.000.
Kakigi, Takao, 4,095,183, Cl. 325-17.000.

Cyclops Corporation: *See—*
Scott, Harley D., 4,094,108, Cl. 52-1.000.

Czerwin, Edward Peter, to Du Pont de Nemours, E. I., and Company. Process of preparing corrugated paper board with a particular polyvinyl alcohol modified starch-based corrugating adhesive. 4,094,718, Cl. 156-210.000.

Dahm, Manfred: *See—*
Behrenz, Wolfgang; Schapel, Dietmar; and Dahm, Manfred, 4,094,970, Cl. 424-78.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Sumimoto, Mitsuhiro; and Kohama, Haruo, 4,094,642, Cl. 23-254.00R.

Daikin Kogyo Co., Ltd.: *See—*
Tatemoto, Masayoshi; and Tamaru, Sinji, 4,094,826, Cl. 260-2.20R.

Daimler-Benz Aktiengesellschaft: *See—*
Conrad, Ulrich, 4,094,791, Cl. 210-316.000.

Damen, Theodoar Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, to Bell Telephone Laboratories, Incorporated. Tunable infrared and far-infrared source by four-photon mixing. 4,095,122, Cl. 307-88.300.

DaMert, Fred Allen. Curved prism ornament. 4,094,084, Cl. 40-613.000.

Danemar, Ake; Johansson, Arne; and Nerf, Owe, to Asea AB. Capacitor bank. 4,095,264, Cl. 361-274.000.

Daniel, Donald S., Jr. Surgical razor blade with integral guard. 4,094,066, Cl. 30-346.580.

Danielsson, Nils Allan; and Lindblom, Karl-Peter Christian, to Applied Research Laboratories S.A. Coil for producing a homogeneous magnetic field in a cylindrical space. 4,095,202, Cl. 335-213.000.

Danneberg, Peter: *See—*
Weber, Karl-Heinz; Bauer, Adolf; Danneberg, Peter; and Kuhn, Franz Josef, 4,094,984, Cl. 424-269.000.

Dar-Mar, Inc.: *See—*
Berndt, Robert Charles; and Eady, George B., 4,094,472, Cl. 242-54.00R.

Darrel, Bernard, to General Electric Company. Method and system for corona source location by acoustic signal detection. 4,095,173, Cl. 324-52.000.

Dart Industries, Inc.: *See—*
Carrock, Frederick Elias; Perron, Peter James; and Zukowski, Edward August, 4,095,016, Cl. 526-137.000.

Daubenbuschel, Werner; Thomas, Alfred; Hess, Dieter; and Augst, Hans-Rudiger, to Kautex Maschinenbau GmbH. Apparatus for the manufacture of hollow bodies of a thermoplastic by blow-moulding. 4,094,620, Cl. 425-140.000.

Davidson, John J.: *See—*
Smith, David A.; and Davidson, John J., 4,094,760, Cl. 204-181.00R.

Davis, Cecil E., to Unarco Industries, Inc. Roller skate toe stop converter. 4,094,525, Cl. 280-11.200.

Davis, John, Jr. Distress signal device. 4,094,267, Cl. 116-124.00B.

Davis, William E. Carburetor for engines using diesel fuel. 4,094,288, Cl. 123-127.000.

Day, Robert L.: *See—*
Smith, Edward A.; and Day, Robert L., 4,094,112, Cl. 52-211.000.

Dayco Corporation: *See—*
Wagner, William T., 4,094,341, Cl. 139-159.000.

de Barros, Ruy F. M., to Societe Anonyme belge d'exploitation de la navigation aerienne (SABENA). Electrical connector. 4,094,570, Cl. 339-75.00M.

De Blauwe, Francis: *See—*
Horsma, David August; and De Blauwe, Francis, 4,095,044, Cl. 174-138.00F.

Decoene, Frans J. G. C.; Muijs, Cornelis G. M.; Van Eecke, Roger H.; and Vansteelant, Marc G., to Clayson N.V. Mower-conditioner. 4,094,132, Cl. 56-14.400.

Deere & Company: *See—*
Cook, Charles Edward, 4,094,205, Cl. 74-242.1FP.

DeJovine, James M.: *See—*
De Vries, Donald L.; and DeJovine, James M., 4,094,799, Cl. 252-29.000.

DeLapp, Darwin Fiske, to Formica Corporation. Low pressure melamine resins containing elastomers. 4,094,846, Cl. 260-29.40R.

Delcroix, Catherine: *See—*
Moinard, Michel; Leturcq, Michel; and Delcroix, Catherine, 4,094,161, Cl. 61-95.000.

De Long, Charles F., to United States Trading International, Inc. Method of reducing loss of water by transpiration and composition therefor. 4,094,845, Cl. 260-29.4UA.

Delphi Instruments, Inc.: *See—*
Robinson, Alfred D., 4,094,337, Cl. 137-505.420.

DeMartino, Ronald N.; and Conciatori, Anthony B., to Celanese Corporation. Polygalactomannan ether compositions. 4,094,795, Cl. 252-8.55R.

Denaro, James J. Adjustable template for tapered airfoil rib profiles. 4,094,071, Cl. 33-174.00B.

Denes, George, to RCA Corporation. Random access-erasable read only memory cell. 4,095,281, Cl. 365-156.000.

Dennard, Robert H.; and Spampinato, Dominic P., to International Business Machines Corporation. Field effect transistors and fabrication of integrated circuits containing the transistors. 4,095,251, Cl. 357-23.000.

Denny, Arthur Francis; Gioffre, Anthony Joseph; and Sherman, John Delano, to Union Carbide Corporation. Sequestering of CA^{++} and MG^{++} in aqueous media using zeolite mixtures. 4,094,778, Cl. 210-38.00A.

Derbyshire, George Cecil, to Jacobs Manufacturing Company, Limited, The. Drill chucks. 4,094,523, Cl. 279-62.000.

DeRomano, Oscar. Irrigation apparatus. 4,094,466, Cl. 239-145.000.

Deutsch, Marshall E.; and Mead, Louis W., to Thyroid Diagnostics, Inc. Test device. 4,094,647, Cl. 23-253.0TP.

Deutsche Benkert GmbH & Co., K.G.: *See—*
Bolsinger, Otto; and Seckelmann, Ingolf, 4,094,324, Cl. 131-10.00A.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, 4,094,771, Cl. 209-4.000.
Knorre, Helmut; Langer, Manfred; and Leidl, Peter, 4,094,693, Cl. 106-111.000.

De Vries, Donald L.; and DeJovine, James M., to Atlantic Richfield Company. Solid particles-containing lubricating oil composition and method for using same. 4,094,799, Cl. 252-29.000.

DeWalt, Michael P., to Sperry Rand Corporation. Fail passive dual servo with continuous motor speed and acceleration and monitoring. 4,094,481, Cl. 244-194.000.

DeWitte, Raymond Edward: *See—*
Clarke, Richard Allen; Chvala, William James; and DeWitte, Raymond Edward, 4,094,526, Cl. 280-47.350.

Deziel, Marcel. Dispensing machine to prepare cups with a dry content. 4,094,345, Cl. 141-174.000.

Diamond, Julius, to William H. Rorer, Inc. Ethynylbenzene compounds and derivatives thereof to treat pain, fever and inflammation. 4,094,995, Cl. 424-353.000.

Dickens, Luther I.; and Nanny, William C., to Radva Plastics Corporation. Building system and method. 4,094,110, Cl. 52-80.000.

Dielectric Systems International, Inc.: *See—*
Kalt, Charles G., 4,094,590, Cl. 350-269.000.

Diesel Kiki Co., Ltd.: *See—*
Shibuya, Tsunenori, 4,094,617, Cl. 417-295.000.

Dieterich, Dieter: *See—*
Wenzel, Wolfgang; and Dieterich, Dieter, 4,094,842, Cl. 260-29.2TN.

Dietz, Ernest W., to Pacific Electricord Company. Safety cap slide. 4,094,569, Cl. 339-40.000.

DiMarco, Bernard, to Gould Inc. Visible blade switch. 4,095,075, Cl. 200-308.000.

Dines, Martin B., to Exxon Research & Engineering Co. Isonitrile intercalation complexes. 4,094,893, Cl. 260-429.00R.

Dishon, Giora: *See—*
Schieber, Michael M.; Beinglass, Israel; and Dishon, Giora, 4,094,268, Cl. 118-49.100.

Dismuke, William Odell, to Pace, Courtney C.; Linton, Ulle C.; and Pace, Casey C., part interest to each. Fuel atomizer. 4,094,290, Cl. 123-141.000.

Ditzig, Albert F., to Molex Incorporated. Sequencing switch assembly. 4,095,089, Cl. 219-441.000.

DiVita, Pietro; and Vannucci, Riccardo, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.P.A. Optical equalizer for signal-transmission system using multimode light guides. 4,094,578, Cl. 350-96.150.

Dixon, Rolland E., to Phillips Petroleum Company. Alkylation process utilizing decreasing amounts of olefin in riser-reactor. 4,094,923, Cl. 260-683.480.

Dobson Park Industries Limited: *See—*
Thompson, Arthur David, 4,094,422, Cl. 214-145.00R.

Dockery, Denzel J. Aquarium gravel cleaner. 4,094,788, Cl. 210-169.000.

Dola, Frank Peter; and Rossler, Frederick William, Jr., to AMP Incorporated. Connector having wire locating means. 4,094,566, Cl. 339-14.00R.

Domoto, Masahiro: *See—*
Oyamada, Takeo; Satoh, Kazuhisa; Tsuru, Shinobu; Domoto, Masahiro; and Narisawa, Shizuo, 4,094,849, Cl. 260-29.6MQ.

Donath, Ernest E. Process for pseudohydrostatic feeding of solids into a reactor. 4,094,651, Cl. 48-210.000.

Doncque, Pierre M., to Agence Nationale de Valorisation de la Recherche (ANVAR). Rigid connection device and its application to motor cycles. 4,094,375, Cl. 180-33.00A.

Dorsett Educational Systems, Inc.: *See*—
Dorsett, Loyd G., 4,094,079, Cl. 35-8.00A.

Dorsett, Loyd G., to Dorsett Educational Systems, Inc. Single medium audio-visual teaching machine. 4,094,079, Cl. 35-8.00A.

Dounce, Eric A.; and Morris, Guy V., to Motorola, Inc. Digital phase correction for coherent-on-receive pulsed radar system. 4,095,224, Cl. 343-17.10R.

Dow Chemical Company, The: *See*—
Alfrey, Turner, Jr.; and Schrenk, Walter J., 4,094,947, Cl. 264-171.000.
Bieler, Barrie H., 4,094,956, Cl. 423-179.000.
Goralski, Christian T.; and Burk, George A., 4,094,880, Cl. 260-302.0SD.
Greenawalt, Eddie Lee, 4,094,629, Cl. 432-98.000.
Kroposki, Lorraine M.; Yoshimine, Masao; and Freedman, Harold H., 4,094,873, Cl. 544-243.000.
Mani, Inder, 4,094,841, Cl. 260-29.60H.
Smith, Hubert Stacy, Jr., 4,094,622, Cl. 425-224.000.
Trepanier, Donald L.; and Britton, Thomas C., 4,094,871, Cl. 260-239.30B.

Drake, Samuel H.: *See*—
Watson, Paul C.; and Drake, Samuel H., 4,094,192, Cl. 73-133.00R.

Dravo Corporation: *See*—
Jaquay, Louis H., 4,094,667, Cl. 75-92.000.

Dremierre, Jean G.: *See*—
Bellouin, Francois C.; and Dremierre, Jean G., 4,094,188, Cl. 73-81.000.

Drohomirecky, Walter. Tell it to the judge game. 4,094,510, Cl. 273-251.000.

Dubois, Robert, to Plastiroute S.A. Road-surface additive for preventing ice and melting snow. 4,094,686, Cl. 106-13.000.

Ducournau, Jean Paul: *See*—
Anizan, Pierre; Ducournau, Jean Paul; Gilberton, Paul; and Mevel, Yves, 4,095,054, Cl. 179-18.0ES.

Dulken, Hartmut: *See*—
Beschoner, Hans-Hermann; Guder, Gottfried; Dulken, Hartmut; and Kassel, Karl-Heinz, 4,094,675, Cl. 96-1.500.

Dullinger, Karl: *See*—
Kronseder, Hermann; Dullinger, Karl; and Matzinger, Kurt, 4,094,411, Cl. 209-97.000.

Dumont, Fritz, to Baugesellschaft Klammt KG. Method and apparatus for driving sheet piles into the ground. 4,094,156, Cl. 61-53.500.

Duncan, Farris N.: *See*—
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,094,455, Cl. 229-15.000.

Dunlop Limited: *See*—
Ford, Peter, 4,094,353, Cl. 152-310.000.

Du Pont de Nemours, E. I., and Company: *See*—
Anolick, Colin; Robinson, Vivian Marie; and Stewart, Charles Winfield, Sr., 4,095,009, Cl. 428-310.000.
Blackwell, Julian Theron, 4,094,894, Cl. 260-453.0SP.
Blickenstaff, Robert Alan, 4,094,948, Cl. 264-206.000.
Czerwin, Edward Peter, 4,094,718, Cl. 156-210.000.
Fitzgerald, Patrick Henry, 4,094,699, Cl. 106-288.00Q.
Guschl, Randolph Joseph, 4,094,856, Cl. 260-45.9NP.
Vladuchick, Susan Anne, 4,094,985, Cl. 424-270.000.
Wolfe, James Richard, Jr., 4,094,857, Cl. 260-45.9QB.

Durfee, William K.: *See*—
Symonds, Alan P.; and Durfee, William K., 4,095,139, Cl. 315-153.000.

Duteurtre, Philippe: *See*—
Soula, Gerard; and Duteurtre, Philippe, 4,094,802, Cl. 252-51.50A.

Duttweiler, Donald Lars; and Hofmann, Allan Michael, to Bell Telephone Laboratories, Incorporated. Quasi-pulse stuffing synchronization. 4,095,053, Cl. 179-15.0AF.

Dybas, Richard A.; Graham, Donald W.; and Brown, Jeannette E., to Merck & Co., Inc. Anticoccidial cyclicamino ethanols and esters thereof. 4,094,976, Cl. 424-228.000.

Dyckerhoff Zementwerke Aktiengesellschaft: *See*—
Rauschenfels, Eberhard, 4,094,692, Cl. 106-104.000.

Dykes, Willis G., to Lasco, Inc. Method and apparatus for using electrical current to destroy weeds in and around crop rows. 4,094,095, Cl. 47-1.300.

Dymo Industries, Inc.: *See*—
Edwards, Richard A.; and Olson, Cecil G., 4,094,244, Cl. 101-66.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Sturm, Karl Gunter; and Bruning, Klaus, 4,094,721, Cl. 156-309.000.

E. R. Squibb & Sons, Inc.: *See*—
Varma, Ravi K., 4,094,840, Cl. 260-239.55R.

Eady, George B.: *See*—
Berndt, Robert Charles; and Eady, George B., 4,094,472, Cl. 242-54.00R.

Eastman Kodak Company: *See*—
Maskasky, Joe E., 4,094,684, Cl. 96-108.000.
Sanders, Robert R., 4,094,695, Cl. 106-179.000.

Eaton Corporation: *See*—
Neuman, Richard F., 4,094,390, Cl. 188-196.00D.

Ebauches S.A.: *See*—
Chetelat, Fernand; and Hersberger, Pierre, 4,094,138, Cl. 58-39.500.

Ebelt, Gunter, to Maschinenfabrik Gluckauf Beukenberg G.m.b.H. Workpiece-holding fixture for honing machine. 4,094,103, Cl. 51-34.00F.

Ebersberger, Hans: *See*—
Aichinger, Horst; and Ebersberger, Hans, 4,095,109, Cl. 250-374.000.

Eckelt, Michael: *See*—
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; Petzold, Manfred; and Uphues, Gunter, 4,094,812, Cl. 252-321.000.

Ed. Rohr AG: *See*—
Rohr, Eduard, 4,094,302, Cl. 126-400.000.

Edmunds, George W.: *See*—
Hoppmann, Kurt H.; and Edmunds, George W., 4,094,412, Cl. 209-106.000.

Edmunds, Raymond S., Jr. Apparatus for handling extrudable substances. 4,094,122, Cl. 53-23.000.

Edo-Aire Mitchell: *See*—
Nixon, John M., 4,094,480, Cl. 244-180.000.

Edwards, Richard A.; and Olson, Cecil G., to Dymo Industries, Inc. Hand-held bar code label marking device. 4,094,244, Cl. 101-66.000.

Edwards, William J.: *See*—
Ketterer, Stanley J.; and Edwards, William J., 4,094,261, Cl. 112-228.000.

Ehara, Mitsuo: *See*—
Takagi, Tadao; Yagi, Toru; Ehara, Mitsuo; and Yamada, Tatsumi, 4,094,292, Cl. 123-179.00G.

Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,094,201, Cl. 74-56.000.

Ehrenhaft, Franz F., to Anamorphic Ltd. Additive color system with compensation of repeatability errors of variable-density electrooptical filter units. 4,095,099, Cl. 250-205.000.

Ehrenskjold, Nils Oluf: *See*—
Munk, Torben; and Ehrenskjold, Nils Oluf, 4,094,614, Cl. 416-140.000.

Eichbaum, Barlane R.: *See*—
Bauer, Donald J.; Eisele, Judith A.; and Eichbaum, Barlane R., 4,094,955, Cl. 423-123.000.

Einhorn, Ruediger, to Coats & Clark, Inc. Hard wall fastener. 4,094,490, Cl. 248-489.000.

Eisele, Judith A.: *See*—
Bauer, Donald J.; Eisele, Judith A.; and Eichbaum, Barlane R., 4,094,955, Cl. 423-123.000.

Ekato-Werk: *See*—
Todtenhaupt, Erich; Muller, Wolfgang; Schupper, Hans; and Geng, Walter, 4,094,638, Cl. 21-61.000.

Electric Power Research Institute: *See*—
Netzel, Philip C.; and Ponder, Jonathan Z., 4,095,041, Cl. 174-28.000.

Electric Power Research Institute, Inc.: *See*—
Glenn, Robert G., 4,094,615, Cl. 416-215.000.
Sisk, Francis J., 4,094,165, Cl. 62-115.000.

Electro-Thermal Corporation: *See*—
Jerles, James B., 4,094,166, Cl. 62-158.000.

Electroacustic GmbH: *See*—
Richter, Erhard; and Borsum, Dietrich, 4,094,511, Cl. 274-39.00A.

Elfab Corporation: *See*—
Langham, Arvin L., 4,094,573, Cl. 339-176.0MP.

Ellendt, Gunther: *See*—
Knofel, Hartmut; and Ellendt, Gunther, 4,094,907, Cl. 260-570.00D.

Elliott, James O., to General Motors Corporation. Triband vehicle antenna. 4,095,229, Cl. 343-715.000.

Elliott-Lewis Corporation: *See*—
Bevan, James, 4,094,445, Cl. 222-1.000.

Ellis, Jerry. Agitator for paint spray cans. 4,095,286, Cl. 366-293.000.

Ells, John William; Parker, Ian David; and Walker, David Baird Langley, to British Petroleum Company Limited, The. Offshore structure and method. 4,094,163, Cl. 61-111.000.

Elscint Ltd.: *See*—
Inbar, Dan; and Klein, Yitzhak, 4,095,108, Cl. 250-369.000.

Eltra Corporation: *See*—
Gesell, William Fred, 4,094,284, Cl. 123-119.00A.

Emmons, Donald Earl: *See*—
Waterman, Peter G.; and Emmons, Donald Earl, 4,094,039, Cl. 15-250.320.

Engelhard Minerals & Chemicals Corp.: *See*—
Pfefferle, William C., 4,094,142, Cl. 60-39.030.

Engle, Edward Jacob, to Polak's Frutal Works, Inc. Perfumed copolymers of ethylene and polar monomer. 4,095,031, Cl. 526-1.000.

English Clays Lovering Pochin & Company Limited: *See*—
Malden, Peter James, 4,094,736, Cl. 162-175.000.

Enomoto, Hiroshi: *See*—
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,094,991, Cl. 424-309.000.

Erb, C J. Golf club fixture. 4,094,072, Cl. 33-174.00F.

Erickson, Arnold Roderick; and Panzera, Carlino, to Brunswick Corporation. Abradable seal material and composition thereof. 4,094,673, Cl. 75-246.000.

Erikmats, Erik Osten, to Telefonaktiebolaget L M Ericsson. Range side lobe suppression method for a phase modulated radar pulse. 4,095,225, Cl. 343-17.2PC.

Eroyan, Gary. Artificial hand and forearm. 4,094,016, Cl. 3-1.100.

Erwien, Helmut: *See*—
Karsten, Werner; and Erwien, Helmut, 4,094,157, Cl. 61-63.000.

Escher Wyss GmbH: *See*—
Kahmann, Albrecht, 4,094,794, Cl. 210-512.00R.

ESPE Fabrik Pharmazeutischer Praparate GmbH: *See*—
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,095,018, Cl. 526-211.000.

Espenschied, Helmut, to Robert Bosch GmbH. Hydraulic system for an automatic transmission of an automotive vehicle. 4,094,211, Cl. 74-868.000.

Esseltepac Aktiebolag: *See*—
Ganholt, Bo Olov, 4,094,121, Cl. 53-22.00R.

Evans, Grover C. Apparatus for washing and sanitizing containers. 4,094,329, Cl. 134-56.00R.

Evans, John W. Engine preoiler and lubricant reservoir. 4,094,293, Cl. 123-196.00S.

Evers, Ben Fowler. Flat field, roll film transport. 4,094,603, Cl. 355-64.000.

Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick Louis, to International Flavors & Fragrances Inc. α-Oxy(oxo) sulfides in perfume. 4,094,824, Cl. 252-522.000.

Ewen, Joel J., to Tele-Path Industries, Inc. Toll restrictor access circuit. 4,095,056, Cl. 179-18.0DA.

Exline, Roger Edsel, to Borg-Warner Corporation. Safety slitter for thermoplastic sheet. 4,094,217, Cl. 83-6.000.

Exo Elettronica Industriale S.r.l.: *See*—
Tirelli, Paolo, 4,095,159, Cl. 318-605.000.

Exxon Production Research Company: *See*—
Thompson, Gene D.; and Jahns, Hans O., 4,094,149, Cl. 61-1.00R.

Exxon Research & Engineering Co.: *See*—
Bearden, Roby, Jr.; and Aldridge, Clyde L., 4,094,765, Cl. 208-8.000.
Dines, Martin B., 4,094,893, Cl. 260-429.00R.
Fuller, Everett J., 4,094,768, Cl. 208-11.0LE.
Koh, Kwang K.; Nahas, Nicholas C.; Pennington, Robert E.; and Vernon, Lonnie W., 4,094,650, Cl. 48-197.00R.
Langer, Arthur W., Jr., 4,094,818, Cl. 252-429.00C.
Langer, Arthur W., Jr.; and Whitney, Thomas A., 4,094,876, Cl. 260-270.0PD.
McVicker, Gary B.; and Garten, Robert L., 4,094,821, Cl. 252-466.0PT.
Sartori, Guido; and Savage, David W., 4,094,957, Cl. 423-223.000.
Siskin, Michael; and Mayer, Ivan, 4,094,924, Cl. 260-683.510.

F. L. Smith & Co.: *See*—
Rasmussen, Poul; and Kartman, Helge C. C., 4,094,628, Cl. 432-80.000.

Fabian, Wolfgang; Plumer, Werner; Sevenich, Theodor; and Zehnter, Heribert, to Hoesch Werke Aktiengesellschaft. Shearing arrangement. 4,094,219, Cl. 83-345.000.

Fabrique Nationale Herstal S.A. en abrege FN: *See*—
Gevers, Georges A., 4,094,086, Cl. 42-1.00R.

Faccenda, Valerio: *See*—
Bruno, Roberto; and Faccenda, Valerio, 4,094,670, Cl. 75-124.000.

Facom: *See*—
Moulinoux, Andre, 4,094,198, Cl. 73-460.000.

Faisandier, Jacques. Hydraulic control apparatus with feedback. 4,094,226, Cl. 91-39.000.

Falk, Edward J., to Wagner Electric Corporation. Automatic brake adjusting means. 4,094,388, Cl. 188-71.900.

Fancher, Llewellyn W., to Stauffer Chemical Company. Isoxazole phosphates and phosphonates. 4,094,974, Cl. 424-200.000.

Farinon Electric: *See*—
Bradley, Marion W., 4,094,213, Cl. 81-9.50R.
Bradley, Marion W., 4,094,214, Cl. 81-9.50R.

Farley, Roy: *See*—
Flain, Robert James; and Farley, Roy, 4,094,551, Cl. 302-26.000.

Farooq, Saleem: *See*—
Karrer, Friedrich; and Farooq, Saleem, 4,094,993, Cl. 424-337.000.

Faxon Communications Corporation: *See*—
Kolker, Carl R.; Campbell, John Scott; La Fond, Robert L.; and Smith, JaMi (said Kolker, Campbell and LaFond assors. to), 4,095,248, Cl. 358-288.000.

Feaster, Gene R.: *See*—
Simms, Robert A.; and Feaster, Gene R., 4,094,563, Cl. 316-19.000.

Febonio, Richard J., to Torque Systems, Inc. Brush holder for motor or generator. 4,095,131, Cl. 310-239.000.

Fedders Corporation: *See*—
Vogel, Charles A., 4,094,426, Cl. 214-338.000.

Federation of Fly Fishermen: *See*—
Whitlock, David W., 4,094,270, Cl. 119-3.000.

Feess, Erich; Gronen, Willy; and Hertel, Hasso, to Hoechst Aktiengesellschaft. Process for the printing with developing dyes. 4,094,637, Cl. 8-71.000.

Fegley, Charles R.; Morrow, Richard H.; and Naylor, Arthur G., to Western Electric Co., Inc. Methods of and apparatus for conveying, testing and sorting articles and straightening their leads. 4,094,410, Cl. 209-73.000.

Feinstein, Allen I.; Kane, Shantaram G.; and Fields, Ellis K., to Standard Oil Company (Indiana). Process for converting aromatic aldehydes to phenolic compounds. 4,094,912, Cl. 568-802.000.

Fekete, Douglas D., to Oxy Metal Industries Corporation. Method for cleaning tin surfaces. 4,094,701, Cl. 134-2.000.

Felkel, Gerfried; Maier, Gerhard; Guenzel, Wolfgang; and Waitl, Guenther, to Siemens Aktiengesellschaft. Electro-optical coupling element. 4,095,116, Cl. 250-551.000.

Felser, Hans-Josef; and Kley, Kurt Paul, to Bonaval-Werke GmbH. Emptying apparatus for pasty materials. 4,095,287, Cl. 366-194.000.

Fernandez-Baujin, J. M., to Lummus Company, The. Packed bed gas-liquid contactor. 4,094,936, Cl. 261-96.000.

Ferrell, Herbert W. Digital display for weighing scales. 4,094,371, Cl. 177-210.00R.

Ferrell, Wesley; and Shichman, Daniel, to Uniroyal, Inc. Breaker reinforcing tape for belted pneumatic tires, and tires made therefrom. 4,094,354, Cl. 152-361.00R.

Festo-Maschinenfabrik Gottlieb Stoll, Firma: *See*—
Heilmann, Roland, 4,094,384, Cl. 184-55.00A.

Fiberglas Canada Limited: *See*—
Kelly, Norman; Fletcher, William T.; Holden, Derek J.; and Welsh, James J., 4,094,130, Cl. 53-124.00D.

Fields, Ellis K., to Standard Oil Company (Indiana). 2-Hydroxy-3-alkylsulfoxypropyl-1 esters of arene polycarboxylic acids. 4,095,029, Cl. 560-87.000.

Fields, Ellis K.: *See*—
Feinstein, Allen I.; Kane, Shantaram G.; and Fields, Ellis K., 4,094,912, Cl. 568-802.000.

Filimonov, Viktor Dmitrievich: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

Finkensiep, Friedhelm; Meye, Reinhold Walter; and Thor, Gunter, to Henkel Kommanditgesellschaft auf Aktien. Striped soap, its production and apparatus for its production. 4,094,946, Cl. 264-171.000.

Finn, Lawrence J.: *See*—
Friswell, David R.; and Finn, Lawrence J., 4,094,195, Cl. 73-422.0GC.

Finney, James L.: *See*—
LeVere, Richard W.; Vocaturo, Joseph M.; and Finney, James L., 4,094,158, Cl. 61-63.000.

Firestone Tire & Rubber Company, The: *See*—
Valaitis, Joseph Kestutis; and Harwood, Harold James, 4,094,860, Cl. 260-47.00R.

Fischer, Artur. Method of securing an object to a low-strength support structure. 4,094,054, Cl. 29-460.000.

Fischer, Artur. Drive arrangement particularly for a toy model. 4,094,207, Cl. 74-425.000.

Fischer, Artur. Mounting device for use in masonry and the like. 4,094,223, Cl. 35-77.000.

Fischer & Porter Company: *See*—
Herzl, Peter J., 4,094,194, Cl. 73-194.0VS.
Hyams, Irving; Koch, Harold S.; and Aafjes, Herman, 4,094,212, Cl. 81-3.800.

Fisher, Ian Stuart: *See*—
Sheard, Dennis Richard; and Fisher, Ian Stuart, 4,094,926, Cl. 260-860.000.

Fitzgerald, Patrick Henry, to Du Pont de Nemours, E. I., and Company. Process for converting premilled quinacridone to pigmentary form. 4,094,699, Cl. 106-288.00Q.

Flachenecker, Gerhard: *See*—
Meinke, Hans Heinrich; Lindenmeier, Heinz; Landstorfer, Friedrich; Flachenecker, Gerhard; and Hopf, Jochen, 4,095,228, Cl. 343-704.000.

Flaig, Ulrich: *See*—
Bremer, Wolfgang; Heintz, Frieder; Flaig, Ulrich; Kiencke, Uwe; and Glauert, Wolfram, 4,095,179, Cl. 324-207.000.

Flain, Robert James; and Farley, Roy, to National Research Development Corporation. Material conveying systems. 4,094,551, Cl. 302-26.000.

Flanigan, Richard J.; and Hooton, Robert Duane, to Houdaille Industries, Inc. Hydraulic system for tensioning band saw blades. 4,094,218, Cl. 83-62.100.

Flavell Proprietary Limited: *See*—
Cox, Jack Jebson, 4,094,518, Cl. 277-95.000.

Fleck, James N.; Palmer, Richard C.; and Ruffner, Charles L., to Crucible Inc. Method and container for hot isostatic compacting. 4,094,672, Cl. 75-226.000.

Fleckenstein, Paul P., to Bindicator Company. Paddle for use in a rotating-paddle bin level indicator. 4,095,064, Cl. 200-61.210.

Fleischer, Helmut: *See*—
Scheyhing, Hans; Fleischer, Helmut; and Abend, Karl-Ludwig, 4,094,378, Cl. 180-105.00E.

Fleming, Ian George Cameron; and Jones, Raymond Vincent Heavon, to Imperial Chemical Industries Limited. Process for the manufacture of 1-aryl-3-carboxypyrazolid-5-ones. 4,095,024, Cl. 548-367.000.

Fletcher, Roy W.; Volkmann, Robert W.; and Forte, Anthony D., to Union Special Corporation. Button orientating lifting mechanism. 4,094,259, Cl. 112-110.000.

Fletcher, William T.: *See*—
Kelly, Norman; Fletcher, William T.; Holden, Derek J.; and Welsh, James J., 4,094,130, Cl. 53-124.00D.

Flo-Tork, Inc.: *See*—
Carr, Paul, 4,094,231, Cl. 92-128.000.

Floyd, Roger M.: *See*—
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,094,455, Cl. 229-15.000.

Fluet, Francis A., to Westinghouse Electric Corp. Pulse width modulated sine cosine generator. 4,095,275, Cl. 364-721.000.

FMN Schuster & Co.: *See*—
Tschentscher, Alfred, 4,094,471, Cl. 242-18.0PW.

Fobbe, Waldemar: *See—*
Liebscher, Johannes; Schulein, Rolf G.; and Fobbe, Waldemar, 4,094,032, Cl. 15-41.00R.

Fontanes, Sylvain, to Thomson-CSF. Arrangement for coding with compression the absolute value of an analog signal. 4,095,219, Cl. 340-347.0NT.

Food Processes, Inc.: *See—*
Peterson, Don G.; and Harper, Judson M., 4,094,633, Cl. 432-118.000.

Ford Aerospace & Communications Corporation: *See—*
Ramnarace, Jawaharlal, 4,094,711, Cl. 149-4.000.

Ford, John B. Containers for pills and the like. 4,094,408, Cl. 206-534.000.

Ford Motor Company: *See—*
Auiler, James E.; Hamburg, Douglas R.; Hyland, James E.; and Moyer, David F., 4,094,275, Cl. 123-34.00A.
Hamburg, Douglas R., 4,094,291, Cl. 123-141.000.

Ford, Peter, to Dunlop Limited. Tires having a solid polyurethane core. 4,094,353, Cl. 152-310.000.

Formica Corporation: *See—*
DeLapp, Darwin Fiske, 4,094,846, Cl. 260-29.40R.
Huffman, Kenneth Robert; Casey, Donald James; and Thomas, Walter Moreland, 4,094,847, Cl. 260-29.40R.

Forsberg, John Wesley, to Lubrizol Corporation, The. Magnesium-containing complexes, method for their preparation, and compositions containing the same. 4,094,801, Cl. 252-33.000.

Forte, Anthony D.: *See—*
Fletcher, Roy W.; Volkmann, Robert W.; and Forte, Anthony D., 4,094,259, Cl. 112-110.000.

Fortner, Paul W.: *See—*
Colchagoff, Robert D.; Fortner, Paul W.; Kirkman, Richard T.; Naughton, Thomas J.; and Zimmerman, George, 4,094,656, Cl. 65-81.000.

Fourcadier, Chantal S.: *See—*
Bugaut, Andree; and Fourcadier, Chantal S., 4,094,635, Cl. 8-11.000.

Fraas, Lewis M.; and Bleha, William P., Jr., to Hughes Aircraft Company. Process for low temperature stoichiometric recrystallization of compound semiconductor films. 4,095,004, Cl. 427-74.000.

Fraioli, Anthony V., to Galileo Electro-Optics Corp. Electron multiplier. 4,095,132, Cl. 313-103.0CM.

Frank, Alan I. W., to Alan I. W. Frank Corporation. Method of molding polymeric material. 4,094,952, Cl. 264-328.000.

Frank, James P., to General Electric Company. Switch and terminal assembly having strip terminal and mounting member adapted to ground dynamoelectric machine casing on similar conductive surface. 4,095,073, Cl. 200-293.000.

Frank Plasser Bahnbaummaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,094,251, Cl. 104-12.000.

Franke, Walter. Two-stroke combustion engines. 4,094,278, Cl. 123-59.0EC.

Franklin, Howard. Urine specimen collector. 4,094,020, Cl. 128-294.000.

Franz Berrenberg: *See—*
Broder, Gerhard, 4,094,048, Cl. 29-6.000.

Franz, James H., Jr.: *See—*
Matty, Thomas C.; and Franz, James H., Jr., 4,095,153, Cl. 318-376.000.

Franz, John E.: *See—*
Alt, Gerhard H.; and Franz, John E., 4,094,661, Cl. 71-88.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Brunninger, Manfred, 4,094,249, Cl. 104-6.000.
Theurer, Josef, 4,094,250, Cl. 104-12.000.

Fratini, Sabatino A. Snow shovel. 4,094,543, Cl. 294-54.000.

Frazier, Clifford John, to Castcraft Industries, Inc. Method and apparatus of changing characters on a font and preparing a font duplicate. 4,094,680, Cl. 96-41.000.

Frazier, Thomas Cecil; Ashworth, John Thomas; Chumney, Richard Douglas, Jr.; and Meyre, Rene Wilhelm, to American Brands, Inc. Smoking article and method. 4,094,323, Cl. 131-8.00R.

Freedman, Harold H.: *See—*
Kroposki, Lorraine M.; Yoshimine, Masao; and Freedman, Harold H., 4,094,873, Cl. 544-243.000.

Frenken, Klaus: *See—*
Schrewe, Hans; and Frenken, Klaus, 4,094,707, Cl. 148-12.00R.

Frey, Gerald J. Flexible magazine slide projector with movable lens. 4,094,599, Cl. 353-96.000.

Fricker, Paul: *See—*
Ullmann, Werner; Fricker, Paul; and Guenin, Maurice, 4,095,079, Cl. 219-69.00E.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Gerlach, Manfred, 4,094,193, Cl. 73-170.00A.
Sedlmayer, Franz; and Muller, Peter, 4,095,160, Cl. 318-675.000.

Friedman, Maurice W.: *See—*
Vulcano, Vincent N.; and Friedman, Maurice W., 4,094,128, Cl. 53-52.000.

Friedrich Kocks GmbH: *See—*
Bindernagel, Ali, 4,094,049, Cl. 29-33.00C.

Friswell, David R.; and Finn, Lawrence J., to Waters Associates, Inc. Novel seal and apparatus including same. 4,094,195, Cl. 73-422.0GC.

Friswell, David R., to Waters Associates, Inc. Sample injection with automatic cleaning of sampling conduit. 4,094,196, Cl. 73-422.0GC.

Friswell, David R., to Waters Associates, Inc. Low loss sample bottle assembly. 4,094,641, Cl. 23-230.00R.

Fritz Eichenauer, Firma: *See—*
Ohnmacht, Helmut; and Brechner, Ernst, 4,095,086, Cl. 219-283.000.

Frolke, Wilhelm: *See—*
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Frolke, Wilhelm, 4,094,980, Cl. 424-250.000.

Frutiger, Peter; and Gemperle, Bruno, to Anstalt Europaische Handelsgesellschaft. Electronic enciphering- and deciphering apparatus in the form of a pocket calculator. 4,095,046, Cl. 178-22.000.

Fuchs, Francis Joseph, Jr., to Western Electric Co., Inc. Methods for continuous extrusion. 4,094,178, Cl. 72-41.000.

Fuji Photo Film Co., Ltd.: *See—*
Naito, Kenji, 4,094,848, Cl. 260-29.60E.
Tsujino, Nobuyuki; Ogawa, Akira; Shishido, Tadao; and Adachi, Keiichi, 4,094,683, Cl. 96-95.000.
Washizawa, Yasuo; and Ikeda, Tomoaki, 4,094,679, Cl. 96-36.300.

Fuji Photo Optical Co., Ltd.: *See—*
Numata, Saburo; and Fujino, Shin-ichiro, 4,095,243, Cl. 354-60.00L.
Yokoyama, Tsuneo; Yajima, Toshiyuki; Tsuchiya, Kazumichi; and Takemae, Hisao, 4,095,244, Cl. 354-82.000.

Fujii, Yoshio; Shimada, Mitsuo; and Ohnuma, Sadabumi, to Hitachi, Ltd. High sensitivity absorptiometer. 4,094,609, Cl. 356-201.000.

Fujino, Shin-ichiro: *See—*
Numata, Saburo; and Fujino, Shin-ichiro, 4,095,243, Cl. 354-60.00L.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Tanaka, Kunihiko; Kurita, Masaru; and Nishiwaki, Osamu, 4,094,872, Cl. 544-26.000.
Ueda, Ikuo; and Matsuo, Masaaki, 4,094,870, Cl. 260-239.0BD.

Fujita, Hiroshi; Kubota, Munetaka; Makita, Takashi; and Takahashi, Yukishige, to Kajima Kensetsu Kabushiki Kaisha. Anti-freezing method and apparatus for ground surrounding liquified gas storing underground tank. 4,094,151, Cl. 61-36.00A.

Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, to Konishiroku Photo Industry Co., Ltd. Method for processing light-sensitive silver halide photographic material. 4,094,682, Cl. 96-55.000.

Fujiyama, Hikaru; Kasama, Tsuneo; and Higuchi, Shigenobu, to Nippon Oil and Fats Co., Ltd.; and Kokuku Chemical Industry Co. Ltd. Automatic inflating lifesaving buoy. 4,094,028, Cl. 9-321.000.

Fukumoto, Ryoichi; and Igarashi, Toshiro, to Aisin Seiki Kabushiki Kaisha. Free movement preventing device for window glasses of automobiles. 4,094,100, Cl. 49-348.000.

Fuller Company: *See—*
Boyhont, Donald S.; and Warshawsky, Jay, 4,094,626, Cl. 432-58.000.

Fuller, Everett J., to Exxon Research & Engineering Co. Separation of bitumen from tar sands using sulfur and water. 4,094,768, Cl. 208-11.0LE.

Fund, Harry, to Modular Products. Vehicle placarding apparatus. 4,094,083, Cl. 40-536.000.

Furrer, Edwin, to Rieter Machine Works Limited. Method and apparatus for controlling an open-end spinning machine. 4,094,133, Cl. 57-34.00R.

Furuno Electric Co., Ltd.: *See—*
Tanigaki, Hidetoshi, 4,095,128, Cl. 307-254.000.

G & W Electric Specialty Company: *See—*
Akers, Donald J., 4,095,065, Cl. 200-63.00R.

Gabbrielli, Franco. Device and a method for handling material. 4,094,425, Cl. 214-310.000.

Gaertner, Van Russell, to Monsanto Company. Carbonylaldiminomethanephosphonates. 4,094,928, Cl. 260-944.000.

GAF Corporation: *See—*
Biranowski, Jerome B.; and Lorenz, Donald H., 4,094,869, Cl. 260-2.5AW.
Miller, Paul D.; and Porcelli, V. Lorenzo, 4,094,404, Cl. 206-45.150.

Gage, Paul E., to Polymer Corporation, The. Railway truck floating pedestal wear liner. 4,094,253, Cl. 105-225.000.

Galerne, Andre, to International Underwater Contractors, Inc. Diving bell with transparent panoramic viewing. 4,094,160, Cl. 61-69.00R.

Galileo Electro-Optics Corp.: *See—*
Fraioli, Anthony V., 4,095,132, Cl. 313-103.0CM.

Galione, Edward Richard David, to W. Vinten Limited. Balanced portable pedestals. 4,094,484, Cl. 248-162.000.

Gallagher, Robert C., to Westinghouse Electric Corp. Method of neutralizing local defects in charge couple device structures. 4,094,733, Cl. 156-648.000.

Gallatin, Paul M., to Allis-Chalmers Corporation. Contactor having reduced contact bounce and shorter arc time. 4,095,200, Cl. 335-193.000.

Ganholt, Bo Olov, to Esseltepac Aktiebolag. Method and apparatus for packing products in substantially oxygen free atmosphere. 4,094,121, Cl. 53-22.00R.

Garlinghouse, Leslie H. Variable agitator mixer. 4,095,288, Cl. 366-219.000.

Garrison, Charles G.: *See—*
Goddard, Terrence P.; Thatcher, Donald N.; and Garrison, Charles G., 4,094,712, Cl. 149-10.000.

Garten, Robert L.: *See—*
McVicker, Gary B.; and Garten, Robert L., 4,094,821, Cl. 252-466.0PT.

Gast, Lyle E.: *See—*
Schneider, Wilma J.; and Gast, Lyle E., 4,094,838, Cl. 260-22.0TN.

Gearhart-Owen Industries, Inc.: *See—*
King, David W., 4,094,359, Cl. 166-65.00R.

Geary, William R. C. Animal shearing device. 4,094,065, Cl. 30-210.000.
Gebrueder Buehler AG: *See—*
Rennes, Harri; and Lippuner, Christian, 4,094,700, Cl. 127-24.000.
Gellert, Jobst Ulrich. Heater cast for multi-cavity hot runner edge gate. 4,094,447, Cl. 222-146.0HE.
Gema AG Apparatebau: *See—*
Prinzing, Robert, 4,094,654, Cl. 55-290.000.
Gemperle, Bruno: *See—*
Frutiger, Peter; and Gemperle, Bruno, 4,095,046, Cl. 178-22.000.
General Cable Corporation: *See—*
Thompson, Paul F., 4,095,039, Cl. 174-23.00C.
General DataComm Industries, Inc.: *See—*
Johnson, Charles P.; and Lucas, Frederick A., 4,095,045, Cl. 178-2.00R.
General Dynamics Corporation: *See—*
Salmond, William E.; and Auletti, Ronald L., 4,095,230, Cl. 343-729.000.
General Electric Company: *See—*
Bellamy, Winthrop D., 4,094,742, Cl. 195-33.000.
Darrel, Bernard, 4,095,173, Cl. 324-52.000.
Frank, James P., 4,095,073, Cl. 200-293.000.
Lee, Laurence Saul; and Roback, Joseph Philip, 4,094,568, Cl. 339-17.0LM.
Williamson, Dennis F., 4,095,154, Cl. 318-376.000.
General Electro-Magnetic Prospecting, Inc.: *See—*
Muse, Louis Marcel, 4,095,169, Cl. 324-8.000.
General Motors Corporation: *See—*
Elliott, James O., 4,095,229, Cl. 343-715.000.
General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi; and Kazami, Koichi, 4,095,190, Cl. 331-2.000.
General Signal Corporation: *See—*
Bohusch, Glen O.; and Rojecki, Walter E., 4,094,553, Cl. 303-3.000.
Geng, Walter: *See—*
Todtenhaupt, Erich; Muller, Wolfgang; Schupper, Hans; and Geng, Walter, 4,094,638, Cl. 21-61.000.
Genna, Sebastian; and Pang, Sing-Chin. Transaxial radionuclide emission camera apparatus and method. 4,095,107, Cl. 250-363.00S.
George, David Weinschenk, to Wean United, Inc. Apparatus for stretching and stripping belting in a multiplaten press. 4,094,619, Cl. 425-135.000.
George, K. A., to Procter & Schwartz, Inc. Oscillating feed assembly and drive especially for a dryer conveyor. 4,094,399, Cl. 198-535.000.
George, Rudolf: *See—*
Stoffers, Helmut; and George, Rudolf, 4,094,325, Cl. 131-21.00R.
Gerhard Berger GmbH & Co. Fabrik Elektrischer Messgerate: *See—*
Heine, Gunter; and Schaffer, Claus, 4,095,161, Cl. 318-696.000.
Gerlach, Manfred, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Acoustic system for measuring the speed of currents in a body of water. 4,094,193, Cl. 73-170.00A.
Gerry, Martin E. Digital combination lock and means for remotely presetting combination therein. 4,095,239, Cl. 340-147.0MD.
Gerzon, Michael Anthony, to National Research Development Corporation. Non-rotationally-symmetric surround-sound encoding system. 4,095,049, Cl. 179-1.0GQ.
Gesell, William Fred, to Eltra Corporation. Emission control system. 4,094,284, Cl. 123-119.00A.
Gesellschaft fur Kernforschung m.b.H.: *See—*
Hadi, Ali Sameh Abdel; Reinhardt, Johann; and Knapp, Jutta, 4,094,953, Cl. 423-2.000.
Gess, Larry C. Packaging machine. 4,094,125, Cl. 53-29.000.
Gessner, Anton: *See—*
Schrader, Alfons; Schreiner, Waldemar; and Gessner, Anton, 4,094,074, Cl. 34-33.000.
Schrader, Alfons; Schreiner, Waldemar; and Gessner, Anton, 4,094,077, Cl. 34-155.000.
Gevers, Georges A., to Fabrique Nationale Herstal S.A. en abrege FN. Adjusting device for double-barrelled guns. 4,094,086, Cl. 42-1.00R.
Gewerkschaft Eisenhutte Westfalia: *See—*
Jutte, Hans, 4,094,152, Cl. 61-41.00A.
Karsten, Werner; and Erwien, Helmut, 4,094,157, Cl. 61-63.000.
Gibson, Harry W.; and Gunther, Wolfgang H. H., to Xerox Corporation. Developer composition comprising aminolyzed coated carrier. 4,094,803, Cl. 252-62.10P.
Gien, Abraham; and Gien, Bernard Lionel. Pneumatic percussion machines. 4,094,366, Cl. 173-138.000.
Gien, Bernard Lionel: *See—*
Gien, Abraham; and Gien, Bernard Lionel, 4,094,366, Cl. 173-138.000.
Gifford, Phillip H., II, to Phillips Petroleum Company. Fluidized bed retorting of tar sands. 4,094,767, Cl. 208-11.00R.
Giglioli, Frederick G. Steerable camera carriage. 4,095,250, Cl. 354-293.000.
Gilb, Tyrell T., to Simpson Manufacturing Co., Inc. Web tube with separated end walls. 4,094,116, Cl. 52-693.000.
Gilbert, Joseph G., to Allor Foundation. Iodine-polyvinylpyrrolidone solid product and method of preparation. 4,094,967, Cl. 424-28.000.
Gilberton, Paul: *See—*
Anizan, Pierre; Ducournau, Jean Paul; Gilberton, Paul; and Mevel, Yves, 4,095,054, Cl. 179-18.0ES.
Gillery, Frank H.; Pressau, Jean P.; and Kubichan, Robert E., to PPG Industries, Inc. Sputter coating of glass with an oxide of a metal having an atomic number between 48 and 51 and mixtures thereof. 4,094,763, Cl. 204-192.00P.
Gilles Atlan: *See—*
Le Cornec, Jacques, 4,094,314, Cl. 128-142.200.
Gillette Company, The: *See—*
Trotta, Robert Anthony, 4,094,063, Cl. 30-47.000.
Gioffre, Anthony Joseph: *See—*
Denny, Arthur Francis; Gioffre, Anthony Joseph; and Sherman, John Delano, 4,094,778, Cl. 210-38.00A.
Giordano, Costanzo. Filter for paint or other liquids. 4,094,787, Cl. 210-103.000.
Giraud, Gabriel. Miniature system for central heating and water heating. 4,095,087, Cl. 219-298.000.
Girling Limited: *See—*
Brix, Hermann Josef; and Wienand, Hans-Jurgen, 4,094,389, Cl. 188-73.300.
Girotra, Narindar N.: *See—*
Wendler, Norman L.; Girotra, Narindar N.; and Zelawski, Zbigniew S., deceased, 4,094,878, Cl. 260-297.00Z.
Giudicelli, Don Pierre Rene Lucien: *See—*
Kaplan, Jean-Pierre; Jalfre, Maurice; and Giudicelli, Don Pierre Rene Lucien, 4,094,992, Cl. 424-324.000.
Glasrock Products, Inc.: *See—*
Johnston, Douglas W., 4,094,303, Cl. 128-1.00R.
Glassmeyer, John J.; and Kelley, Joseph T., to Pullman Incorporated. Roll away decking system. 4,094,546, Cl. 296-28.00M.
Glauert, Wolfram: *See—*
Bremer, Wolfgang; Heintz, Frieder; Flaig, Ulrich; Kiencke, Uwe; and Glauert, Wolfram, 4,095,179, Cl. 324-207.000.
Glaxo Laboratories Limited: *See—*
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,095,021, Cl. 544-22.000.
Glenn, Robert G., to Electric Power Research Institute, Inc. Blade attachment structure for gas turbine rotor. 4,094,615, Cl. 416-215.000.
Glick, Louis Michael: *See—*
Moran, Kevin E.; and Korzeniewski, Eugene C., 4,095,120, Cl. 290-44.000.
Goddard, Terrence P.; Thatcher, Donald N.; and Garrison, Charles G., to Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc. Consolidated charges incorporating integral ignition compounds. 4,094,712, Cl. 149-10.000.
Goetsch, Henry E.; and Mercik, Henry J., Jr., to United Technologies Corporation. Fuel pump diagnostics for internal combustion engine. 4,094,191, Cl. 73-118.000.
Goffe, William L., to Xerox Corporation. Method for forming a charge pattern. 4,095,233, Cl. 346-75.000.
Goldberg, Arthur: *See—*
Sann, Robert I.; and Goldberg, Arthur, 4,094,368, Cl. 177-128.000.
Goldenberg, Marvin M.: *See—*
Wright, George C.; and Goldenberg, Marvin M., 4,095,023, Cl. 542-422.000.
Goncalves, Antonin, to L'Oreal. Method of manufacturing a pair of plastic gloves and packaging them within a sheet of wrapping material. 4,094,120, Cl. 53-21.0FW.
Gonzalez, James, to Raymond Lee Organization, Inc., The, a part interest. Electronic slide ruler calculator. 4,095,273, Cl. 364-705.000.
Good, Wayne W., to Harter Corporation. Modular wall panel structure. 4,094,113, Cl. 52-222.000.
Goodman, Lawrence Alan, to RCA Corporation. Liquid crystal matrix display device with transistors. 4,094,582, Cl. 350-333.000.
Goodyear Tire & Rubber Company, The: *See—*
Sandstrom, Paul H., 4,094,831, Cl. 260-5.000.
Goosey, Richard Ernest: *See—*
Hubbard, Roger Thomas John; Goosey, Richard Ernest; and Neal, Donald Francis, 4,094,708, Cl. 148-32.500.
Goralski, Christian T.; and Burk, George A., to Dow Chemical Company, The. Bis(chloromethylthio)thiadiazoles. 4,094,880, Cl. 260-302.0SD.
Goranson, Paul L.: *See—*
Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., 4,094,424, Cl. 214-304.000.
Gordon, Carl. Apparatus for determining food content. 4,095,274, Cl. 364-715.000.
Gori-Vaerk A/S: *See—*
Munk, Torben; and Ehrenskjold, Nils Oluf, 4,094,614, Cl. 416-140.000.
Gorin, Everett, to Continental Oil Company. Coal liquefaction product deashing process. 4,094,766, Cl. 208-10.000.
Gornik, Erich: *See—*
Damen, Theodoar Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, 4,095,122, Cl. 307-88.300.
Gorog, Sandor: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,094,908, Cl. 260-570.00R.
Gossink, Robert Georg: *See—*
van Ass, Henricus Matheus Jacobus Marie; and Gossink, Robert Georg, 4,094,689, Cl. 106-50.000.
Goto, Hiroshi, to Japan Steel Works, Ltd., The. Backup roll of the built-up type. 4,094,050, Cl. 29-129.500.
Goto, Kenji; and Sawada, Daisaku, to Tokyo Jidosha Kogyo Kabushiki Kaisha. Intake valve mechanism for preventing back flow of exhaust gas. 4,094,277, Cl. 123-52.0MF.
Gotoh, Kazuhiko; Kawashima, Hiroshi; and Katayama, Tsuyoshi, to Nippon Telegraph and Telephone Public Corporation. Multi-stage switching network in a telecommunication switching system. 4,095,055, Cl. 179-18.0GF.
Gould Inc.: *See—*
DiMarco, Bernard, 4,095,075, Cl. 200-308.000.

Gourley, Charles R. Loading block for muzzle-loading gun. 4,094,098, Cl. 42-90.000.
Graber-Rogg, Inc.: *See—*
Martin, Harold B.; and Wagner, Erwin O., 4,095,043, Cl. 174-65.00R.
Graham, Donald W.: *See—*
Dybas, Richard A.; Graham, Donald W.; and Brown, Jeannette E., 4,094,976, Cl. 424-228.000.
Granite State Machine Co., Inc.: *See—*
Wescoat, George F., 4,094,451, Cl. 225-96.000.
Grasselli, Robert K.: *See—*
Bartek, Joseph P.; and Grasselli, Robert K., 4,094,922, Cl. 260-671.00C.
Greenawalt, Eddie Lee, to Dow Chemical Company, The. Vertical kiln apparatus. 4,094,629, Cl. 432-98.000.
Greenberg, Michael J., to Quaker Oats Company, The. Flavoring with 1,8-dihydroxy-2,9-dithia-tricyclo tetradecane and derivatives thereof. 4,094,998, Cl. 426-535.000.
Greenwald, Harry, to Walter Kidde & Company, Inc. Control device for a coin operated mechanism. 4,094,396, Cl. 194-1.00M.
Greenwood, Eugene C. Target detecting and locating system. 4,094,225, Cl. 89-41.00L.
Gref, Hans: *See—*
Herzhoff, Peter; Gref, Hans; and Schweicher, Wolfgang, 4,095,063, Cl. 200-61.130.
Gregg, James S.; and Reynolds, William J., to Samsonite Corporation. Luggage latch mechanism. 4,094,392, Cl. 190-41.00R.
Gregory, Gordon Ian: *See—*
Bradshaw, Janice; Cook, Martin Christopher; and Gregory, Gordon Ian, 4,095,021, Cl. 544-22.000.
Greischel, Christoph; Harand, Elmar; Maritsch, Franz; and Michel, Eberhard, to Siemens Aktiengesellschaft. Pressurized-water reactor installation. 4,094,737, Cl. 176-65.000.
Grieve, Douglas V. Multiple outlet blower scroll for an industrial oven. 4,094,631, Cl. 432-176.000.
Griffiths, Evan, to Amtel, Inc. Multiple stage wire drawing machine. 4,094,180, Cl. 72-280.000.
Grigat, Ernst: *See—*
Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, 4,094,852, Cl. 260-37.00N.
Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, 4,094,861, Cl. 260-47.00P.
Grimley, Arthur W. T.: *See—*
Shoji, Kouichi; and Grimley, Arthur W. T., 4,094,549, Cl. 299-17.000.
Groeneweg, Willem Hendrik; Tuma, Alois Vaclav; and Harwood, Leopold Albert, to RCA Corporation. Controlled oscillator with increased immunity to parasitic capacitance. 4,095,255, Cl. 358-17.000.
Gronen, Willy: *See—*
Feess, Erich; Gronen, Willy; and Hertel, Hasso, 4,094,637, Cl. 8-71.000.
Gross-Given Manufacturing Company: *See—*
Lotspeich, Joseph A., 4,094,440, Cl. 221-12.000.
Grossbach, Alfred. Seatbelt system for motor cars. 4,094,533, Cl. 280-745.000.
Grover, Brian Clifford: *See—*
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Harris, Geoffrey John, to Square D Company. Transducer. 4,095,177, Cl. 324-164.000.
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Harris, Thomas D., to Southern Saw Service, Inc. Honing device. 4,094,106, Cl. 51-214.000.
Harris, Walter Jefferson; and Neufeld, Ronald Murray, to Boeing Company, The. Rotating pot shaped eddy current probe in which only a small fraction of the lip forming the outer core portion is retained. 4,095,181, Cl. 324-238.000.
Harrold, Maurice, to Lucas Industries Limited. Intermittently operable electrical switch assembly. 4,095,208, Cl. 337-125.000.
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Harvey, Samuel E.; Whitehead, James Stephen; and Goranson, Paul L., to Carrier Corporation. Refuse container discharge station. 4,094,424, Cl. 214-304.000.
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Hayashi, Osamu. Gold color copper alloy for restorative dentistry. 4,094,671, Cl. 75-157.500.
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Haynes, Richard T.; and Young, Harry L., to Monsanto Company. Method of preparation of clear concentrate compositions. 4,094,851, Cl. 260-33.6UA.
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Heard, Robert Arthur Henderson. Securing device. 4,094,487, Cl. 248-231.000.
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Hehl, Karl. Die closing unit with oversize injection molding die. 4,094,621, Cl. 425-190.000.
Heiling, Gerald Michael, to International Business Machines Corporation. Straight-line optical scanner using rotating holograms. 4,094,576, Cl. 350-3.710.
Heilmann, Roland, to Festo-Maschinenfabrik Gottlieb Stoll, Firma. Bayonet connecting system for collector bowl attachment to connecting housing of compressed air conditioning device. 4,094,384, Cl. 184-55.00A.
Heine, Gunter; and Schaffer, Claus, to Gerhard Berger GmbH & Co. Fabrik Elektrischer Messgerate. Variable stepping-angle synchronous motor. 4,095,161, Cl. 318-696.000.
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Herzl, Peter J., to Fischer & Porter Company. Sensing system for vortex-type flowmeters. 4,094,194, Cl. 73-194.0VS.
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Hild, Melvin O. Apparatus for fine grading compacted earth. 4,094,362, Cl. 172-120.000.

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Hishiki, Hideo, to Victor Company of Japan, Limited. Encapsulated transformer assembly. 4,095,206, Cl. 336-96.000.

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Fujii, Yoshio; Shimada, Mitsuo; and Ohnuma, Sadabumi, 4,094,609, Cl. 356-201.000.
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Suzuki, Kazuo; and Kataoka, Hiroyuki, 4,094,386, Cl. 187-29.00R.
Yoshimura, Masayoshi; Otsuki, Keizo; Shoji, Senji; Yamada, Tomio; Shimizu, Ichio; and Arai, Yuji, 4,095,253, Cl. 357-81.000.

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Hodges, Dewey W. Micro display with magnifier. 4,094,598, Cl. 353-76.000.

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Duttweiler, Donald Lars; and Hofmann, Allan Michael, 4,095,053, Cl. 179-15.0AF.

Hold, Peter, to USM Corporation. Injection molding machine controls. 4,094,940, Cl. 264-40.600.

Holden, Derek J.: *See*—
Kelly, Norman; Fletcher, William T.; Holden, Derek J.; and Welsh, James J., 4,094,130, Cl. 53-124.00D.

Holdren, Frederick V.; Hugli, Hans W.; Kubler, John M.; Larson, Martin E.; and Van Schoiack, Michael M., to Sundstrand Data Control, Inc. Accelerometer. 4,094,199, Cl. 73-517.00B.

Holgersson, Sigbjorn P. H. E., to Kopparfors AB. Method of pulping with sulfite liquor containing formic acid esters. 4,094,735, Cl. 162-76.000.

Holliday, Robert George, to Xerox Corporation. Reproduction of paged material from microform cards. 4,094,601, Cl. 355-26.000.

Holliday, Robert George, to Xerox Corporation. Microform card alignment device. 4,094,602, Cl. 355-40.000.

Holmes, Gordon W.; and Nelham, Roy W., to R. Nelham & Associates Incorporated. Ice-cream sandwich forming apparatus. 4,094,236, Cl. 99-450.400.

Holper, Manfred; Schertel, Gunter; and Kosters, Egon, to VOKO Franz Vogt & Co. Work table having lines embodied therein. 4,094,256, Cl. 108-50.000.

Homeyer, Bernhard: *See*—
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Sirrenberg, Wilhelm; Hammann, Ingeborg; Homeyer, Bernhard; and Thomas, Herbert, 4,094,975, Cl. 424-216.000.

Homko, Joseph C., to United States of America, Army. Thread protector and seal. 4,094,224, Cl. 86-31.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Nakamura, Akihisa; Umemoto, Takashi; and Arai, Sakuji, 4,094,276, Cl. 123-52.00M.
Nakano, Teruyuki; and Otaka, Syoichi, 4,094,282, Cl. 123-117.00A.
Takagi, Tadao; Yagi, Toru; Ehara, Mitsuo; and Yamada, Tatsumi, 4,094,292, Cl. 123-179.00G.

Honeywell Inc.: *See*—
Milewski, Sylvester, 4,094,463, Cl. 236-82.000.
Quarton, William T.; and Lowe, Peter R., 4,095,235, Cl. 346-110.00R.
Shroff, Bansi K.; and Shu, Stephen K., 4,094,478, Cl. 242-192.000.

Hooton, Robert Duane: *See*—
Flanigan, Richard J.; and Hooton, Robert Duane, 4,094,218, Cl. 83-62.100.

Hoover Company, The: *See*—
Minton, Keith G., 4,094,535, Cl. 285-7.000.

Hopf, Jochen: *See*—
Meinke, Hans Heinrich; Lindenmeier, Heinz; Landstorfer, Friedrich; Flachenecker, Gerhard; and Hopf, Jochen, 4,095,228, Cl. 343-704.000.

Hoppmann Corporation: *See*—
Hoppmann, Kurt H.; and Edmunds, George W., 4,094,412, Cl. 209-106.000.

Hoppmann, Kurt H.; and Edmunds, George W., to Hoppmann Corporation. Rolling method of sorting particulate articles. 4,094,412, Cl. 209-106.000.

Horiike, Yasuhiro: *See*—
Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, 4,094,722, Cl. 156-345.000.

Horsma, David August; and De Blauwe, Francis, to Raychem Corporation. Multiple cable adapter and splice case including the same. 4,095,044, Cl. 174-138.00F.

Hosaka, Hideo: *See*—
Nishikawa, Mitsuo; Hosaka, Hideo; and Maemori, Jun, 4,094,342, Cl. 140-93.200.

Houdaille Industries, Inc.: *See*—
Flanigan, Richard J.; and Hooton, Robert Duane, 4,094,218, Cl. 83-62.100.

House Food Industrial Company Limited: *See*—
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; and Yasuda, Atsushi, 4,094,996, Cl. 426-115.000.

Howard, Dean D., to United States of America, Navy. Four-dimensional isometric radar target image display. 4,095,223, Cl. 343-7.900.

Howard, Frank N. Neck roll for helmet. 4,094,015, Cl. 2-415.000.

Howarth, John T.: *See—*
United States of America, National Aeronautics and Space Administration; Howarth, John T.; Sheth, Suresh; Sidman, Kenneth R.; and Massucco, Arthur A., 4,094,943, Cl. 264-130.000.

Howe Richardson Scale Company: *See—*
Sann, Robert I.; and Goldberg, Arthur, 4,094,368, Cl. 177-128.000.

Howorth Air Engineering Limited: *See—*
Howorth, Frederick Hugh, 4,094,232, Cl. 98-36.000.

Howorth, Frederick Hugh, to Howorth Air Engineering Limited. Clean air zone. 4,094,232, Cl. 98-36.000.

Hruza, Denis E.: *See—*
Hall, John B.; Hruza, Denis E.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 4,094,823, Cl. 252-522.000.

Hsieh, Henry L., to Phillips Petroleum Company. Vinyl monomer polymerization or copolymerization catalyzed by organoaluminum-organophosphine-metal salt of a beta-diketone catalyst system. 4,095,017, Cl. 526-188.000.

Hubbard, Roger Thomas John; Goosey, Richard Ernest; and Neal, Donald Francis, to Imperial Metal Industries (KYNOCH) Limited. Titanium-base alloys. 4,094,708, Cl. 148-32.500.

Hubele, Adolf, to Ciba-Geigy Corporation. Certain phytofungicidal N-furanyl carbonyl and tetrahydrofuranyl carbonyl, N-(substituted)-phenyl alanines. 4,094,990, Cl. 424-285.000.

Huber, Richard: *See—*
Schmidt, Max Christof; and Huber, Richard, 4,094,476, Cl. 242-125.200.

Hudson, Raymond A., to Teledyne Industries, Inc. Dental syringe. 4,094,311, Cl. 128-66.000.

Hudson, Robert H. Plier wrench. 4,094,215, Cl. 81-127.000.

Huffman, Kenneth Robert; Casey, Donald James; and Thomas, Walter Moreland, to Formica Corporation. Elastomer modified melamine resins. 4,094,847, Cl. 260-29.40R.

Hughes Aircraft Company: *See—*
Fraas, Lewis M.; and Bleha, William P., Jr., 4,095,004, Cl. 427-74.000.

Hughes, Donald R. Pick for tubular cylinder locks. 4,094,176, Cl. 70-394.000.

Hughes, Frank Marion, to International Business Machines Corporation. Typewriter selection drive follower block and shuttle assembly. 4,094,397, Cl. 400-161.400.

Hugli, Hans W.: *See—*
Holdren, Frederick V.; Hugli, Hans W.; Kubler, John M.; Larson, Martin E.; and Van Schoiack, Michael M., 4,094,199, Cl. 73-517.00B.

Hujer, Friedrich; and Zangenfeind, Helmut, to Agfa-Gevaert Aktiengesellschaft. Apparatus for processing exposed photographic films and cassettes for such films. 4,094,726, Cl. 156-502.000.

Humphreys, Peter Franklin; and Willis, Edwin, to Lever Brothers Company. Preparation of detergent bars containing zinc oxide. 4,094,807, Cl. 252-131.000.

Hundt, Murray T.: *See—*
Hildebolt, William M.; and Hundt, Murray T., 4,095,001, Cl. 426-656.000.

Hurst, Jack, to Gulf Oil Corporation. Nonpanelling plastic oil container. 4,094,407, Cl. 206-524.300.

Hurt, Bernard: *See—*
Kervizic, Jacques; and Hurt, Bernard, 4,095,201, Cl. 335-210.000.

Huyssen, Phillip H. Flower holder. 4,094,096, Cl. 47-41.130.

Hyams, Irving; Koch, Harold S.; and Aafjes, Herman, to Fischer & Porter Company. Fuse-mate. 4,094,212, Cl. 81-3.800.

Hyde, Michael B.: *See—*
Van Rossem, Richard; and Hyde, Michael B., 4,094,209, Cl. 74-543.000.

Hyland, James E.: *See—*
Auiler, James E.; Hamburg, Douglas R.; Hyland, James E.; and Moyer, David F., 4,094,275, Cl. 123-34.00A.

I.I.C., Inc.: *See—*
Cloud, Don L., 4,094,597, Cl. 353-35.000.

Iaccino, George V., to Lock Technology, Inc. Lock removal tool. 4,094,052, Cl. 29-263.000.

Iberica de Calcomanias, S.A.: *See—*
Lopez, Eduardo Valdez, 4,094,716, Cl. 156-87.000.

Ichinose, Shiro. Lifting devices for flat screen printer. 4,094,242, Cl. 101-123.000.

ICI Americas Inc.: *See—*
Markiewitz, Kenneth H.; and Restaino, Alfred J., 4,095,019, Cl. 526-215.000.

ICI Australia Limited: *See—*
Barnett, George Henry, 4,094,714, Cl. 149-88.000.

Ida, Shuichiro: *See—*
Sogo, Yoshitaka; and Ida, Shuichiro, 4,094,206, Cl. 74-360.000.

Igarashi, Toshiro: *See—*
Fukumoto, Ryoichi; and Igarashi, Toshiro, 4,094,100, Cl. 49-348.000.

Ignoffo, Carlo M.: *See—*
Batzer, Othmer F.; and Ignoffo, Carlo M., 4,094,969, Cl. 424-78.000.

Iguchi, Seiya: *See—*
Iwai, Yasuto; Okabe, Masayoshi; Seki, Naotoshi; Hiai, Atsuhiko; and Iguchi, Seiya, 4,094,780, Cl. 210-38.00B.

Ikeda, Tomoaki: *See—*
Washizawa, Yasuo; and Ikeda, Tomoaki, 4,094,679, Cl. 96-36.300.

Ikemoto, Kikuji. Balloon neck fitting. 4,094,347, Cl. 141-313.000.

Ikezawa, Yuji: *See—*
Harada, Taro; Okita, Taisuke; Hara, Takahisa; and Ikezawa, Yuji, 4,094,854, Cl. 260-42.460.

Ilk, Emil. Apparatus for the production of stemmed glassware. 4,094,660, Cl. 65-325.000.

Imazeki, Kazuyoshi; and Kazami, Koichi, to General Research of Electronics, Inc. Tuning system. 4,095,190, Cl. 331-2.000.

Imperial Chemical Industries Limited: *See—*
Brooks, John Langshaw; and Budziarek, Richard, 4,094,863, Cl. 260-77.50B.
Fleming, Ian George Cameron; and Jones, Raymond Vincent Heavon, 4,095,024, Cl. 548-367.000.
Hayden, Percy; and Clayton, Richard William, 4,094,889, Cl. 260-348.340.
Jones, Michael Edward Benet, 4,094,867, Cl. 260-79.30M.
Lake, Ivan James Samuel; and Sampson, Roy John, 4,094,919, Cl. 260-668.00A.
Morton, Michael John, 4,094,690, Cl. 106-73.400.
Sheard, Dennis Richard; and Fisher, Ian Stuart, 4,094,926, Cl. 260-860.000.
Shearing, Herbert Jackson, 4,094,829, Cl. 260-2.5AK.

Imperial Metal Industries (KYNOCH) Limited: *See—*
Hubbard, Roger Thomas John; Goosey, Richard Ernest; and Neal, Donald Francis, 4,094,708, Cl. 148-32.500.

Inbar, Dan; and Klein, Yitzhak, to Elscint Ltd. Signal processing equipment for radiation imaging apparatus. 4,095,108, Cl. 250-369.000.

Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Campioni, Armando, 4,095,256, Cl. 358-35.000.

Industrial Filter & Pump Mfg. Co.: *See—*
Schmidt, Henry, Jr., 4,094,790, Cl. 210-289.000.

Ing. Giovanni Rodio & C. Impresa Costruzioni Speciali S.p.A.: *See—*
Torti, Giovanni; and Tomiolo, Andrea, 4,094,117, Cl. 52-698.000.

Ingenieur-Boero: *See—*
Lesk, Adolf; and Hageleit, Wolfgang, 4,094,078, Cl. 34-181.000.

Ingle, Edwin Coy, to Bell Telephone Laboratories, Incorporated. Pulse signal detector and/or filter. 4,095,125, Cl. 307-234.000.

Institut Francais du Petrole: *See—*
Sugier, Andre; and la Villa, Florentino, 4,094,777, Cl. 210-32.000.

Institutul de Cercetari in Constructii si Economia Constructiilor: *See—*
Moraru, Dinu Stefan; Pitis, Ion; and Bogos, Constantin, 4,094,691, Cl. 106-95.000.

Interlake, Inc.: *See—*
Keyser, Naaman H.; and Cline, James C., 4,094,731, Cl. 156-616.00R.

International Business Machines Corporation: *See—*
Bhattacharyya, Arup; and Silverman, Ronald, 4,094,057, Cl. 29-571.000.
Bluethman, Robert Glenn; and Boyd, William Weller, 4,095,277, Cl. 364-900.000.
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Knauft, Guenter; Richter, Stephan; and Schulze-Schoelling, Hermann, 4,095,270, Cl. 364-200.000.
Campbell, John Edward; and Thompson, Gerhard Robert, 4,095,283, Cl. 365-230.000.
Crouse, William George, 4,095,218, Cl. 340-347.0DA.
Dennard, Robert H.; and Spampinato, Dominic P., 4,095,251, Cl. 357-23.000.
Harris, Richard Hunter, 4,095,066, Cl. 200-67.00A.
Heiling, Gerald Michael, 4,094,576, Cl. 350-3.710.
Hoffman, Charles Reeves; and Nunnery, William Burrell, 4,095,126, Cl. 307-237.000.
Hughes, Frank Marion, 4,094,397, Cl. 400-161.400.
Kellogg, Robert Melroy; and Mulzet, Alfred Paul, 4,094,461, Cl. 233-40.000.
Vrba, Richard Alan, 4,095,265, Cl. 364-200.000.

International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,094,824, Cl. 252-522.000.
Hall, John B.; Hruza, Denis E.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 4,094,823, Cl. 252-522.000.

International Telephone and Telegraph Corporation: *See—*
Toal, Desmond J.; McKenzie, John Matthew; and Hemby, Franklin Delano, 4,094,550, Cl. 301-37.00R.

International Underwater Contractors, Inc.: *See—*
Galerne, Andre, 4,094,160, Cl. 61-69.00R.

International Vibration Engineering: *See—*
Pelat, Roger Patrice; and Le Pierres, Gildas, 4,094,387, Cl. 188-1.00B.

InterRoyal Corporation: *See—*
Benoit, Roland A.; and Guillot, Edmund, 4,094,024, Cl. 5-66.000.

Interx Research Corporation: *See—*
Bodor, Nicholas S., 4,094,983, Cl. 424-266.000.

Iosso, Richard C. Wear-resistant zinc articles. 4,095,014, Cl. 428-658.000.

IPCO Hospital Supply Corporation: *See—*
Benjamin, Thomas A., 4,094,571, Cl. 339-91.00R.

Irro, Fritz: *See—*
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Knauft, Guenter; Richter, Stephan; and Schulze-Schoelling, Hermann, 4,095,270, Cl. 364-200.000.

Isaksson, Arvid. Device in collapsible anchors. 4,094,265, Cl. 114-307.000.

Ishida, Tomio: *See—*
Nagasawa, Masahiro; Ishida, Tomio; and Yoshikawa, Yoshitaka, 4,094,897, Cl. 264-105.000.

Ishido, Yasuhiro, to Towa Electric Co., Ltd. System for detecting leakage faults in a pipeline by measuring the distributed capacitance of sections of a sensing cable buried parallel to said pipeline. 4,095,174, Cl. 324-52.000.

Ishihama, Atsumi: *See*—
Komamura, Takeo; Okamoto, Tadao; and Ishihama, Atsumi, 4,094,313, Cl. 128-130.000.
Ishihara, Taketoshi: *See*—
Aoki, Mitsugu; and Ishihara, Taketoshi, 4,094,592, Cl. 351-30.000.
Ishii, Toshiji: *See*—
Miyamoto, Teruo; Ishii, Toshiji; Miura, Yoshikazu; and Nitta, Tohei, 4,095,204, Cl. 336-57.000.
Ishikawa, Toshikatsu; Kanemaru, Toyonosuke; Teranishi, Haruo; and Onishi, Kazumasa, to Nippon Carbon Co., Ltd. Composites of oxidized graphite material and expanded graphite material. 4,094,951, Cl. 264-325.000.
Italsider S.p.A.: *See*—
Bruno, Roberto; and Faccenda, Valerio, 4,094,670, Cl. 75-124.000.
Italy, Pavel; Kilik, Ondrej; Barancok, Jozef; and Miski, Anton, to Strojarske a metalurgicke zavody. Hydraulic pressure regulating arrangement. 4,094,144, Cl. 60-445.000.
Ito, Masaru: *See*—
Murayama, Seiichi; Yamamoto, Manabu; Ito, Masaru; Yasuda, Makoto; Watanabe, Makoto; and Kayama, Kunifusa, 4,095,142, Cl. 315-248.000.
Ito, Yoshinobu: *See*—
Takano, Hiroshi; Yoshino, Masatsugu; Naka, Hiroshi; Ito, Yoshinobu; and Matsushika, Tadao, 4,094,676, Cl. 96-90.00R.
Itoh, Kikuo: *See*—
Tachikawa, Kyoji; and Itoh, Kikuo, 4,094,059, Cl. 29-599.000.
ITT Industries, Incorporated: *See*—
Hoehn, Wolfgang; and Sauer, Wolfgang, 4,095,194, Cl. 331-108.00D.
Ivanov, Georgy Nikolaevich: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.
Iwai, Yasuto; Okabe, Masayoshi; Seki, Naotoshi; Hiai, Atsuhiko; and Iguchi, Seiya, to Mitsui Toatsu Chemicals Inc. Process for the liquid phase oxidation of organic substance-containing effluents. 4,094,780, Cl. 210-38.00B.
Iwantscheff, Georg; and Scheubeck, Egmont, to Siemens Aktiengesellschaft. Method for processing biomaterials. 4,094,640, Cl. 23-230.0PC.
Izon Corporation: *See*—
Waly, Adnan, 4,094,596, Cl. 353-27.00R.
Waly, Adnan, 4,094,600, Cl. 353-120.000.
J & H Manufacturing, Inc.: *See*—
Jones, Herman L., 4,094,723, Cl. 156-353.000.
J. I. Case Company: *See*—
Miller, Larry E., 4,094,557, Cl. 305-54.000.
Jackson, Carl D. Rapidly adjustable tool. 4,094,216, Cl. 81-156.000.
Jackson, George F. Centrifugal flotation separator. 4,094,783, Cl. 210-63.00R.
Jacobs Manufacturing Company, Limited, The: *See*—
Derbyshire, George Cecil, 4,094,523, Cl. 279-62.000.
Jacobson, Ralph Spencer. Screw driver. 4,094,350, Cl. 145-50.00D.
Jacobson, Sidney S., to United States of America, Army. High packing density propellant grains. 4,094,248, Cl. 102-100.000.
Jacoby, Charles E. Cutting board attachment. 4,094,221, Cl. 83-762.000.
Jacquelin, Roland: *See*—
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Jahns, Hans O.: *See*—
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Jalfre, Maurice: *See*—
Kaplan, Jean-Pierre; Jalfre, Maurice; and Giudicelli, Don Pierre Rene Lucien, 4,094,992, Cl. 424-324.000.
James, Michael R.: *See*—
Cohen, Jerome B.; and James, Michael R., 4,095,103, Cl. 250-277.0CH.
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Cabagnero, Ramon Jane, 4,094,531, Cl. 280-649.000.
Jankowski, Raymond E.: *See*—
Bowers, Lewis H.; Jankowski, Raymond E.; and Sullivan, John L., 4,094,834, Cl. 260-19.0UA.
Janzen, G. Jay, to Phillips Petroleum Company. Automatic turbidimetric titration. 4,095,272, Cl. 364-497.000.
Japan Steel Works, Ltd., The: *See*—
Goto, Hiroshi, 4,094,050, Cl. 29-129.500.
Nakai, Setsuo; and Ochi, Hiroshi, 4,094,942, Cl. 264-102.000.
Jaquay, Louis H., to Dravo Corporation. Melting of fine particulate material in a high-speed rotary furnace. 4,094,667, Cl. 75-92.000.
Jarrott, Bevyn; and Spector, Sidney, to Hoffmann-La Roche Inc. Clonidine assay. 4,094,964, Cl. 424-1.000.
Jellinek, Karl; and Oellig, Rudi, to Rutgerswerke Aktiengesellschaft. Compound and its use in synthetic resin mixtures having high reactivity under the action of ionizing rays. 4,094,925, Cl. 260-836.000.
Jenkins, Cecil: *See*—
Woolslayer, Homer J.; Jenkins, Cecil; and Woods, Robert D., 4,094,051, Cl. 29-159.00R.
Jenkins, John Michael: *See*—
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Jerles, James B., to Electro-Thermal Corporation. Air conditioning control system. 4,094,166, Cl. 62-158.000.
Jindrick, James A., to Snap-on Tools Corporation. Compression measuring apparatus. 4,094,190, Cl. 73-115.000.
Joa, Curt G. Sanitary pad with multiple end folds. 4,094,319, Cl. 128-284.000.
Jochum, Peter: *See*—
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,095,018, Cl. 526-211.000.
Joh. A. Benckiser: *See*—
Krueger, Friedrich; and Michel, Walter, 4,094,782, Cl. 210-58.000.
Johanson, John E., to Johanson Manufacturing Corporation. Adjustable capacitors. 4,095,263, Cl. 361-292.000.
Johanson Manufacturing Corporation: *See*—
Johanson, John E., 4,095,263, Cl. 361-292.000.
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Danemar, Ake; Johansson, Arne; and Nerf, Owe, 4,095,264, Cl. 361-274.000.
Johansson, Ernst Lennart: *See*—
Lundstrom, Hans Per Olof; and Johansson, Ernst Lennart, 4,094,364, Cl. 173-80.000.
Johansson, Haldor Ingemar; Lindstrom, Dag Torsten; and Soderberg, John Lennart, to Pharmacia Fine Chemicals AB. Vinylic group containing dextran derivative gel in particle form for separation purposes. 4,094,833, Cl. 260-17.4GC.
John, Ernest F.: *See*—
Struger, Odo J.; Searcy, William W.; and John, Ernest F., 4,095,094, Cl. 235-304.100.
John Wyeth & Brother Limited: *See*—
Newberry, Robert Anthony, 4,095,025, Cl. 548-378.000.
John Zink Company: *See*—
Reed, Robert D.; and Street, Vern A., 4,094,632, Cl. 431-202.000.
Johnson, Charles P.; and Lucas, Frederick A., to General DataComm Industries, Inc. Method and apparatus for signaling in a communication system. 4,095,045, Cl. 178-2.00R.
Johnson, Donald L., to Chicago Rawhide Manufacturing Company. Metal alloy composition with improved wear resistance. 4,094,514, Cl. 277-92.000.
Johnson Products Div. of Sealed Power Corporation: *See*—
Kueny, Kenneth E., 4,094,279, Cl. 123-90.510.
Johnson, Richard C., to Warren-Teed Laboratories, Inc. Method of treating gastric ulcers using 5,6-dihydro-1,4-dithiinoxides. 4,094,988, Cl. 424-277.000.
Johnson, William A.; Pausmer, Philip W.; and Harmon, Russel J., to Sway-A-Way Corporation. Torsion bar adjusting device. 4,094,532, Cl. 280-695.000.
Johnson, William C., to Bethlehem Steel Corporation. Corrosion inhibiting primer paint for hand cleaned ferrous metals. 4,094,837, Cl. 260-22.00A.
Johnston, Douglas W., to Glasrock Products, Inc. Tympanic membrane vent. 4,094,303, Cl. 128-1.00R.
Jonason, Hans: *See*—
Andersson, Verner; and Jonason, Hans, 4,095,088, Cl. 219-345.000.
Jones, Herman L.; and Haugen, John H. Method for dispensing adhesive transfer tape for engagement with a moving strip of photographic film prints. 4,094,719, Cl. 156-250.000.
Jones, Herman L., to J & H Manufacturing, Inc. Variable width film splicer. 4,094,723, Cl. 156-353.000.
Jones, Michael Edward Benet, to Imperial Chemical Industries Limited. Manufacture of polysulphones. 4,094,867, Cl. 260-79.30M.
Jones, Raymond Vincent Heavon: *See*—
Fleming, Ian George Cameron; and Jones, Raymond Vincent Heavon, 4,095,024, Cl. 548-367.000.
Jones, William F.; and Hochberger, Gerald J., to Railweight, Inc. System for single draft weighing of cars coupled in motion. 4,094,367, Cl. 177-1.000.
Jong, Slosson B. Walker. 4,094,330, Cl. 135-67.000.
Jordan, John Francis; and Lampkin, Curtis Magill, to Photon Power, Inc. Cadmium sulfide film. 4,095,006, Cl. 427-427.000.
Jurin, Robert J.: *See*—
Zerfahs, Arthur S.; and Jurin, Robert J., 4,094,104, Cl. 51-76.00R.
Jutte, Hans, to Gewerkschaft Eisenhutte Westfalia. Apparatus for laying a pipe line. 4,094,152, Cl. 61-41.00A.
K. J. Law Engineers, Inc.: *See*—
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Kabushiki Kaisha Komatsu Seisakusho: *See*—
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Kabushiki Kaisha Meidensha: *See*—
Saito, Takahito, 4,095,195, Cl. 331-116.00R.
Kabushiki Kaisha Mitutoyo Seisakusho: *See*—
Tanada, Tetsunori, 4,094,070, Cl. 33-166.000.
Kabushiki Kaisha Sato Kenkyusho: *See*—
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Kabushiki Kaisha Seikosha: *See*—
Oshima, Kenji; Matsumoto, Tomohisa; Yamazaki, Hiroshi; and Yoshioka, Tamotsu, 4,095,130, Cl. 310-162.000.
Kabushiki Kaisha Suwa Seikosha: *See*—
Aizawa, Hitomi, 4,094,136, Cl. 58-23.00R.
Kaeding, Warren W.; and Young, Lewis B., to Mobil Oil Corporation. Selective ethylation of mono alkyl benzenes. 4,094,921, Cl. 260-671.00C.

Howarth, John T.: *See—*
United States of America, National Aeronautics and Space Administration; Howarth, John T.; Sheth, Suresh; Sidman, Kenneth R.; and Massucco, Arthur A., 4,094,943, Cl. 264-130.000.
Howe Richardson Scale Company: *See—*
Sann, Robert I.; and Goldberg, Arthur, 4,094,368, Cl. 177-128.000.
Howorth Air Engineering Limited: *See—*
Howorth, Frederick Hugh, 4,094,232, Cl. 98-36.000.
Howorth, Frederick Hugh, to Howorth Air Engineering Limited. Clean air zone. 4,094,232, Cl. 98-36.000.
Hruza, Denis E.: *See—*
Hall, John B.; Hruza, Denis E.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 4,094,823, Cl. 252-522.000.
Hsieh, Henry L., to Phillips Petroleum Company. Vinyl monomer polymerization or copolymerization catalyzed by organoaluminum-organophosphine-metal salt of a beta-diketone catalyst system. 4,095,017, Cl. 526-188.000.
Hubbard, Roger Thomas John; Goosey, Richard Ernest; and Neal, Donald Francis, to Imperial Metal Industries (KYNOCH) Limited. Titanium-base alloys. 4,094,708, Cl. 148-32.500.
Hubele, Adolf, to Ciba-Geigy Corporation. Certain phytofungicidal N-furanyl carbonyl and tetrahydrofuranyl carbonyl, N-(substituted)-phenyl alanines. 4,094,990, Cl. 424-285.000.
Huber, Richard: *See—*
Schmidt, Max Christof; and Huber, Richard, 4,094,476, Cl. 242-125.200.
Hudson, Raymond A., to Teledyne Industries, Inc. Dental syringe. 4,094,311, Cl. 128-66.000.
Hudson, Robert H. Plier wrench. 4,094,215, Cl. 81-127.000.
Huffman, Kenneth Robert; Casey, Donald James; and Thomas, Walter Moreland, to Formica Corporation. Elastomer modified melamine resins. 4,094,847, Cl. 260-29.40R.
Hughes Aircraft Company: *See—*
Fraas, Lewis M.; and Bleha, William P., Jr., 4,095,004, Cl. 427-74.000.
Hughes, Donald R. Pick for tubular cylinder locks. 4,094,176, Cl. 70-394.000.
Hughes, Frank Marion, to International Business Machines Corporation. Typewriter selection drive follower block and shuttle assembly. 4,094,397, Cl. 400-161.400.
Hugli, Hans W.: *See—*
Holdren, Frederick V.; Hugli, Hans W.; Kubler, John M.; Larson, Martin E.; and Van Schoiack, Michael M., 4,094,199, Cl. 73-517.00B.
Hujer, Friedrich; and Zangenfeind, Helmut, to Agfa-Gevaert Aktiengesellschaft. Apparatus for processing exposed photographic films and cassettes for such films. 4,094,726, Cl. 156-502.000.
Humphreys, Peter Franklin; and Willis, Edwin, to Lever Brothers Company. Preparation of detergent bars containing zinc oxide. 4,094,807, Cl. 252-131.000.
Hundt, Murray T.: *See—*
Hildebolt, William M.; and Hundt, Murray T., 4,095,001, Cl. 426-656.000.
Hurst, Jack, to Gulf Oil Corporation. Nonpanelling plastic oil container. 4,094,407, Cl. 206-524.300.
Hurt, Bernard: *See—*
Kervizic, Jacques; and Hurt, Bernard, 4,095,201, Cl. 335-210.000.
Huyssen, Phillip H. Flower holder. 4,094,096, Cl. 47-41.130.
Hyams, Irving; Koch, Harold S.; and Aafjes, Herman, to Fischer & Porter Company. Fuse-mate. 4,094,212, Cl. 81-3.800.
Hyde, Michael B.: *See—*
Van Rossem, Richard; and Hyde, Michael B., 4,094,209, Cl. 74-543.000.
Hyland, James E.: *See—*
Auiler, James E.; Hamburg, Douglas R.; Hyland, James E.; and Moyer, David F., 4,094,275, Cl. 123-34.00A.
I.I.C., Inc.: *See—*
Cloud, Don L., 4,094,597, Cl. 353-35.000.
Iaccino, George V., to Lock Technology, Inc. Lock removal tool. 4,094,052, Cl. 29-263.000.
Iberica de Calcomanias, S.A.: *See—*
Lopez, Eduardo Valdez, 4,094,716, Cl. 156-87.000.
Ichinose, Shiro. Lifting devices for flat screen printer. 4,094,242, Cl. 101-123.000.
ICI Americas Inc.: *See—*
Markiewitz, Kenneth H.; and Restaino, Alfred J., 4,095,019, Cl. 526-215.000.
ICI Australia Limited: *See—*
Barnett, George Henry, 4,094,714, Cl. 149-88.000.
Ida, Shuichiro: *See—*
Sogo, Yoshitaka; and Ida, Shuichiro, 4,094,206, Cl. 74-360.000.
Igarashi, Toshiro: *See—*
Fukumoto, Ryoichi; and Igarashi, Toshiro, 4,094,100, Cl. 49-348.000.
Ignoffo, Carlo M.: *See—*
Batzer, Othmer F.; and Ignoffo, Carlo M., 4,094,969, Cl. 424-78.000.
Iguchi, Seiya: *See—*
Iwai, Yasuto; Okabe, Masayoshi; Seki, Naotoshi; Hiai, Atsuhiko; and Iguchi, Seiya, 4,094,780, Cl. 210-38.00B.
Ikeda, Tomoaki: *See—*
Washizawa, Yasuo; and Ikeda, Tomoaki, 4,094,679, Cl. 96-36.300.
Ikemoto, Kikuji. Balloon neck fitting. 4,094,347, Cl. 141-313.000.
Ikezawa, Yuji: *See—*
Harada, Taro; Okita, Taisuke; Hara, Takahisa; and Ikezawa, Yuji, 4,094,854, Cl. 260-42.460.
Ilk, Emil. Apparatus for the production of stemmed glassware. 4,094,660, Cl. 65-325.000.
Imazeki, Kazuyoshi; and Kazami, Koichi, to General Research of Electronics, Inc. Tuning system. 4,095,190, Cl. 331-2.000.
Imperial Chemical Industries Limited: *See—*
Brooks, John Langshaw; and Budziarek, Richard, 4,094,863, Cl. 260-77.50B.
Fleming, Ian George Cameron; and Jones, Raymond Vincent Heavon, 4,095,024, Cl. 548-367.000.
Hayden, Percy; and Clayton, Richard William, 4,094,889, Cl. 260-348.340.
Jones, Michael Edward Benet, 4,094,867, Cl. 260-79.30M.
Lake, Ivan James Samuel; and Sampson, Roy John, 4,094,919, Cl. 260-668.00A.
Morton, Michael John, 4,094,690, Cl. 106-73.400.
Sheard, Dennis Richard; and Fisher, Ian Stuart, 4,094,926, Cl. 260-860.000.
Shearing, Herbert Jackson, 4,094,829, Cl. 260-2.5AK.
Imperial Metal Industries (KYNOCH) Limited: *See—*
Hubbard, Roger Thomas John; Goosey, Richard Ernest; and Neal, Donald Francis, 4,094,708, Cl. 148-32.500.
Inbar, Dan; and Klein, Yitzhak, to Elscint Ltd. Signal processing equipment for radiation imaging apparatus. 4,095,108, Cl. 250-369.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See—*
Campioni, Armando, 4,095,256, Cl. 358-35.000.
Industrial Filter & Pump Mfg. Co.: *See—*
Schmidt, Henry, Jr., 4,094,790, Cl. 210-289.000.
Ing. Giovanni Rodio & C. Impresa Costruzioni Speciali S.p.A.: *See—*
Torti, Giovanni; and Tomiolo, Andrea, 4,094,117, Cl. 52-698.000.
Ingenieur-Boero: *See—*
Lesk, Adolf; and Hageleit, Wolfgang, 4,094,078, Cl. 34-181.000.
Ingle, Edwin Coy, to Bell Telephone Laboratories, Incorporated. Pulse signal detector and/or filter. 4,095,125, Cl. 307-234.000.
Institut Francais du Petrole: *See—*
Sugier, Andre; and la Villa, Florentino, 4,094,777, Cl. 210-32.000.
Institutul de Cercetari in Constructii si Economia Constructiilor: *See—*
Moraru, Dinu Stefan; Pitis, Ion; and Bogos, Constantin, 4,094,691, Cl. 106-95.000.
Interlake, Inc.: *See—*
Keyser, Naaman H.; and Cline, James C., 4,094,731, Cl. 156-616.00R.
International Business Machines Corporation: *See—*
Bhattacharyya, Arup; and Silverman, Ronald, 4,094,057, Cl. 29-571.000.
Bluethman, Robert Glenn; and Boyd, William Weller, 4,095,277, Cl. 364-900.000.
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Knauft, Guenter; Richter, Stephan; and Schulze-Schoelling, Hermann, 4,095,270, Cl. 364-200.000.
Campbell, John Edward; and Thompson, Gerhard Robert, 4,095,283, Cl. 365-230.000.
Crouse, William George, 4,095,218, Cl. 340-347.0DA.
Dennard, Robert H.; and Spampinato, Dominic P., 4,095,251, Cl. 357-23.000.
Harris, Richard Hunter, 4,095,066, Cl. 200-67.00A.
Heiling, Gerald Michael, 4,094,576, Cl. 350-3.710.
Hoffman, Charles Reeves; and Nunnery, William Burrell, 4,095,126, Cl. 307-237.000.
Hughes, Frank Marion, 4,094,397, Cl. 400-161.400.
Kellogg, Robert Melroy; and Mulzet, Alfred Paul, 4,094,461, Cl. 233-40.000.
Vrba, Richard Alan, 4,095,265, Cl. 364-200.000.
International Flavors & Fragrances Inc.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,094,824, Cl. 252-522.000.
Hall, John B.; Hruza, Denis E.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 4,094,823, Cl. 252-522.000.
International Telephone and Telegraph Corporation: *See—*
Toal, Desmond J.; McKenzie, John Matthew; and Hemby, Franklin Delano, 4,094,550, Cl. 301-37.00R.
International Underwater Contractors, Inc.: *See—*
Galerne, Andre, 4,094,160, Cl. 61-69.00R.
International Vibration Engineering: *See—*
Pelat, Roger Patrice; and Le Pierres, Gildas, 4,094,387, Cl. 188-1.00B.
InterRoyal Corporation: *See—*
Benoit, Roland A.; and Guillot, Edmund, 4,094,024, Cl. 5-66.000.
Interx Research Corporation: *See—*
Bodor, Nicholas S., 4,094,983, Cl. 424-266.000.
Iosso, Richard C. Wear-resistant zinc articles. 4,095,014, Cl. 428-658.000.
IPCO Hospital Supply Corporation: *See—*
Benjamin, Thomas A., 4,094,571, Cl. 339-91.00R.
Irro, Fritz: *See—*
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Knauft, Guenter; Richter, Stephan; and Schulze-Schoelling, Hermann, 4,095,270, Cl. 364-200.000.
Isaksson, Arvid. Device in collapsible anchors. 4,094,265, Cl. 114-307.000.
Ishida, Tomio: *See—*
Nagasawa, Masahiro; Ishida, Tomio; and Yoshikawa, Yoshitaka, 4,094,897, Cl. 264-105.000.
Ishido, Yasuhiro, to Towa Electric Co., Ltd. System for detecting leakage faults in a pipeline by measuring the distributed capacitance of sections of a sensing cable buried parallel to said pipeline. 4,095,174, Cl. 324-52.000.

Ishihama, Atsumi: *See*—
Komamura, Takeo; Okamoto, Tadao; and Ishihama, Atsumi, 4,094,313, Cl. 128-130.000.

Ishihara, Taketoshi: *See*—
Aoki, Mitsugu; and Ishihara, Taketoshi, 4,094,592, Cl. 351-30.000.

Ishii, Toshiji: *See*—
Miyamoto, Teruo; Ishii, Toshiji; Miura, Yoshikazu; and Nitta, Tohei, 4,095,204, Cl. 336-57.000.

Ishikawa, Toshikatsu; Kanemaru, Toyonosuke; Teranishi, Haruo; and Onishi, Kazumasa, to Nippon Carbon Co., Ltd. Composites of oxidized graphite material and expanded graphite material. 4,094,951, Cl. 264-325.000.

Italsider S.p.A.: *See*—
Bruno, Roberto; and Faccenda, Valerio, 4,094,670, Cl. 75-124.000.

Italy, Pavel; Kilik, Ondrej; Barancok, Jozef; and Miski, Anton, to Strojarske a metalurgicke zavody. Hydraulic pressure regulating arrangement. 4,094,144, Cl. 60-445.000.

Ito, Masaru: *See*—
Murayama, Seiichi; Yamamoto, Manabu; Ito, Masaru; Yasuda, Makoto; Watanabe, Makoto; and Kayama, Kunifusa, 4,095,142, Cl. 315-248.000.

Ito, Yoshinobu: *See*—
Takano, Hiroshi; Yoshino, Masatsugu; Naka, Hiroshi; Ito, Yoshinobu; and Matsushika, Tadao, 4,094,676, Cl. 96-90.00R.

Itoh, Kikuo: *See*—
Tachikawa, Kyoji; and Itoh, Kikuo, 4,094,059, Cl. 29-599.000.

ITT Industries, Incorporated: *See*—
Hoehn, Wolfgang; and Sauer, Wolfgang, 4,095,194, Cl. 331-108.00D.

Ivanov, Georgy Nikolaevich: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

Iwai, Yasuto; Okabe, Masayoshi; Seki, Naotoshi; Hiai, Atsuhiko; and Iguchi, Seiya, to Mitsui Toatsu Chemicals Inc. Process for the liquid phase oxidation of organic substance-containing effluents. 4,094,780, Cl. 210-38.00B.

Iwantscheff, Georg; and Scheubeck, Egmont, to Siemens Aktiengesellschaft. Method for processing biomaterials. 4,094,640, Cl. 23-230.0PC.

Izon Corporation: *See*—
Waly, Adnan, 4,094,596, Cl. 353-27.00R.
Waly, Adnan, 4,094,600, Cl. 353-120.000.

J & H Manufacturing, Inc.: *See*—
Jones, Herman L., 4,094,723, Cl. 156-353.000.

J. I. Case Company: *See*—
Miller, Larry E., 4,094,557, Cl. 305-54.000.

Jackson, Carl D. Rapidly adjustable tool. 4,094,216, Cl. 81-156.000.

Jackson, George F. Centrifugal flotation separator. 4,094,783, Cl. 210-63.00R.

Jacobs Manufacturing Company, Limited, The: *See*—
Derbyshire, George Cecil, 4,094,523, Cl. 279-62.000.

Jacobson, Ralph Spencer. Screw driver. 4,094,350, Cl. 145-50.00D.

Jacobson, Sidney S., to United States of America, Army. High packing density propellant grains. 4,094,248, Cl. 102-100.000.

Jacoby, Charles E. Cutting board attachment. 4,094,221, Cl. 83-762.000.

Jacquelin, Roland: *See*—
Blanc, Raymond; and Jacquelin, Roland, 4,094,369, Cl. 177-147.000.

Jahns, Hans O.: *See*—
Thompson, Gene D.; and Jahns, Hans O., 4,094,149, Cl. 61-1.00R.

Jalfre, Maurice: *See*—
Kaplan, Jean-Pierre; Jalfre, Maurice; and Giudicelli, Don Pierre Rene Lucien, 4,094,992, Cl. 424-324.000.

James, Michael R.: *See*—
Cohen, Jerome B.; and James, Michael R., 4,095,103, Cl. 250-277.0CH.

Jane, S.A.: *See*—
Cabagnero, Ramon Jane, 4,094,531, Cl. 280-649.000.

Jankowski, Raymond E.: *See*—
Bowers, Lewis H.; Jankowski, Raymond E.; and Sullivan, John L., 4,094,834, Cl. 260-19.0UA.

Janzen, G. Jay, to Phillips Petroleum Company. Automatic turbidimetric titration. 4,095,272, Cl. 364-497.000.

Japan Steel Works, Ltd., The: *See*—
Goto, Hiroshi, 4,094,050, Cl. 29-129.500.
Nakai, Setsuo; and Ochi, Hiroshi, 4,094,942, Cl. 264-102.000.

Jaquay, Louis H., to Dravo Corporation. Melting of fine particulate material in a high-speed rotary furnace. 4,094,667, Cl. 75-92.000.

Jarrott, Bevyn; and Spector, Sidney, to Hoffmann-La Roche Inc. Clonidine assay. 4,094,964, Cl. 424-1.000.

Jellinek, Karl; and Oellig, Rudi, to Rutgerswerke Aktiengesellschaft. Compound and its use in synthetic resin mixtures having high reactivity under the action of ionizing rays. 4,094,925, Cl. 260-836.000.

Jenkins, Cecil: *See*—
Woolslayer, Homer J.; Jenkins, Cecil; and Woods, Robert D., 4,094,051, Cl. 29-159.00R.

Jenkins, John Michael: *See*—
Bates, Leslie Raymond; and Jenkins, John Michael, 4,094,879, Cl. 260-299.000.

Jerles, James B., to Electro-Thermal Corporation. Air conditioning control system. 4,094,166, Cl. 62-158.000.

Jindrick, James A., to Snap-on Tools Corporation. Compression measuring apparatus. 4,094,190, Cl. 73-115.000.

Joa, Curt G. Sanitary pad with multiple end folds. 4,094,319, Cl. 128-284.000.

Jochum, Peter: *See*—
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,095,018, Cl. 526-211.000.

Joh. A. Benckiser: *See*—
Krueger, Friedrich; and Michel, Walter, 4,094,782, Cl. 210-58.000.

Johanson, John E., to Johanson Manufacturing Corporation. Adjustable capacitors. 4,095,263, Cl. 361-292.000.

Johanson Manufacturing Corporation: *See*—
Johanson, John E., 4,095,263, Cl. 361-292.000.

Johansson, Arne: *See*—
Danemar, Ake; Johansson, Arne; and Nerf, Owe, 4,095,264, Cl. 361-274.000.

Johansson, Ernst Lennart: *See*—
Lundstrom, Hans Per Olof; and Johansson, Ernst Lennart, 4,094,364, Cl. 173-80.000.

Johansson, Haldor Ingemar; Lindstrom, Dag Torsten; and Soderberg, John Lennart, to Pharmacia Fine Chemicals AB. Vinylic group containing dextran derivative gel in particle form for separation purposes. 4,094,833, Cl. 260-17.4GC.

John, Ernest F.: *See*—
Struger, Odo J.; Searcy, William W.; and John, Ernest F., 4,095,094, Cl. 235-304.100.

John Wyeth & Brother Limited: *See*—
Newberry, Robert Anthony, 4,095,025, Cl. 548-378.000.

John Zink Company: *See*—
Reed, Robert D.; and Street, Vern A., 4,094,632, Cl. 431-202.000.

Johnson, Charles P.; and Lucas, Frederick A., to General DataComm Industries, Inc. Method and apparatus for signaling in a communication system. 4,095,045, Cl. 178-2.00R.

Johnson, Donald L., to Chicago Rawhide Manufacturing Company. Metal alloy composition with improved wear resistance. 4,094,514, Cl. 277-92.000.

Johnson Products Div. of Sealed Power Corporation: *See*—
Kueny, Kenneth E., 4,094,279, Cl. 123-90.510.

Johnson, Richard C., to Warren-Teed Laboratories, Inc. Method of treating gastric ulcers using 5,6-dihydro-1,4-dithiinoxides. 4,094,988, Cl. 424-277.000.

Johnson, William A.; Pausmer, Philip W.; and Harmon, Russel J., to Sway-A-Way Corporation. Torsion bar adjusting device. 4,094,532, Cl. 280-695.000.

Johnson, William C., to Bethlehem Steel Corporation. Corrosion inhibiting primer paint for hand cleaned ferrous metals. 4,094,837, Cl. 260-22.00A.

Johnston, Douglas W., to Glasrock Products, Inc. Tympanic membrane vent. 4,094,303, Cl. 128-1.00R.

Jonason, Hans: *See*—
Andersson, Verner; and Jonason, Hans, 4,095,088, Cl. 219-345.000.

Jones, Herman L.; and Haugen, John H. Method for dispensing adhesive transfer tape for engagement with a moving strip of photographic film prints. 4,094,719, Cl. 156-250.000.

Jones, Herman L., to J & H Manufacturing, Inc. Variable width film splicer. 4,094,723, Cl. 156-353.000.

Jones, Michael Edward Benet, to Imperial Chemical Industries Limited. Manufacture of polysulphones. 4,094,867, Cl. 260-79.30M.

Jones, Raymond Vincent Heavon: *See*—
Fleming, Ian George Cameron; and Jones, Raymond Vincent Heavon, 4,095,024, Cl. 548-367.000.

Jones, William F.; and Hochberger, Gerald J., to Railweight, Inc. System for single draft weighing of cars coupled in motion. 4,094,367, Cl. 177-1.000.

Jong, Slosson B. Walker. 4,094,330, Cl. 135-67.000.

Jordan, John Francis; and Lampkin, Curtis Magill, to Photon Power, Inc. Cadmium sulfide film. 4,095,006, Cl. 427-427.000.

Jurin, Robert J.: *See*—
Zerfahs, Arthur S.; and Jurin, Robert J., 4,094,104, Cl. 51-76.00R.

Jutte, Hans, to Gewerkschaft Eisenhutte Westfalia. Apparatus for laying a pipe line. 4,094,152, Cl. 61-41.00A.

K. J. Law Engineers, Inc.: *See*—
Brown, Gordon Ralph, 4,095,180, Cl. 324-233.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Kusada, Shohei; and Kaneko, Tomoyoshi, 4,094,182, Cl. 72-344.000.

Kabushiki Kaisha Meidensha: *See*—
Saito, Takahito, 4,095,195, Cl. 331-116.00R.

Kabushiki Kaisha Mitutoyo Seisakusho: *See*—
Tanada, Tetsunori, 4,094,070, Cl. 33-166.000.

Kabushiki Kaisha Sato Kenkyusho: *See*—
Sato, Yo, 4,094,724, Cl. 156-384.000.

Kabushiki Kaisha Seikosha: *See*—
Oshima, Kenji; Matsumoto, Tomohisa; Yamazaki, Hiroshi; and Yoshioka, Tamotsu, 4,095,130, Cl. 310-162.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Aizawa, Hitomi, 4,094,136, Cl. 58-23.00R.

Kaeding, Warren W.; and Young, Lewis B., to Mobil Oil Corporation. Selective ethylation of mono alkyl benzenes. 4,094,921, Cl. 260-671.00C.

Kaelin, Bette M., to Marvin Glass & Associates. Doll having self-supporting sitting and standing positions. 4,094,093, Cl. 46-160.000.
Kahmann, Albrecht, to Escher Wyss GmbH. Hydrocyclone. 4,094,794, Cl. 210-512.00R.
Kaiser Resources Ltd.: *See—*
Shoji, Kouichi; and Grimley, Arthur W. T. (said Arthur Grimley assors. to), 4,094,549, Cl. 299-17.000.
Kajima Kensetsu Kabushiki Kaisha: *See—*
Fujita, Hiroshi; Kubota, Munetaka; Makita, Takashi; and Takahashi, Yukishige, 4,094,151, Cl. 61-36.00A.
Kakigi, Takao, to Cybernet Electronic Corporation. Display device for transceiver and like. 4,095,182, Cl. 325-17.000.
Kakigi, Takao, to Cybernet Electronic Corporation. Tuning circuit. 4,095,183, Cl. 325-17.000.
Kakui, Kuniaki; Shigeta, Toshihiko; and Koike, Koso, to Toyo Kogyo Co., Ltd. Rotary piston engines. 4,094,618, Cl. 418-178.000.
Kaloi, Cyril M., to United States of America, Navy. Asymmetrically fed magnetic microstrip dipole antenna. 4,095,227, Cl. 343-700.0MS.
Kalt, Charles G., to Dielectric Systems International, Inc. Electrostatic device for gating electromagnetic radiation. 4,094,590, Cl. 350-269.000.
Kameyama, Tadao: *See—*
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; and Komuro, Katsu, 4,094,385, Cl. 187-29.00R.
Kamlet, Mortimer J.: *See—*
Boyars, Carl; and Kamlet, Mortimer J., 4,094,710, Cl. 149-3.000.
Kane, Shantaram G.: *See—*
Feinstein, Allen I.; Kane, Shantaram G.; and Fields, Ellis K., 4,094,912, Cl. 568-802.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Yamada, Hideaki; Takahashi, Satomi; and Yoneda, Koji, 4,094,741, Cl. 195-29.000.
Kaneko, Tomoyoshi: *See—*
Kusada, Shohei; and Kaneko, Tomoyoshi, 4,094,182, Cl. 72-344.000.
Kaneko, Yutaka: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, 4,094,682, Cl. 96-55.000.
Kanemaru, Toyonosuke: *See—*
Ishikawa, Toshikatsu; Kanemaru, Toyonosuke; Teranishi, Haruo; and Onishi, Kazumasa, 4,094,951, Cl. 264-325.000.
Kantor, Frederick W. Rotary thermodynamic apparatus. 4,094,170, Cl. 62-499.000.
Kaplan, Jean-Pierre; Jalfre, Maurice; and Giudicelli, Don Pierre Rene Lucien, to Synthelabo. Benzylidene derivatives. 4,094,992, Cl. 424-324.000.
Karcher, Thomas D.; and Hammond, Harry H., to Hansen Manufacturing Company, The. Combination quick connect-disconnect pneumatic/electrical coupling. 4,094,567, Cl. 339-15.000.
Karino, Kimiji, to Hitachi, Ltd. Carburetor assembly. 4,094,931, Cl. 261-23.00B.
Karlen, Harvey R.: *See—*
Schlegel, Norman H.; and Karlen, Harvey R., 4,094,449, Cl. 222-475.000.
Karpp, Heinrich. Floor cleaning device. 4,094,036, Cl. 15-244.00R.
Karpp, Heinrich. Wiping device. 4,094,037, Cl. 15-245.000.
Karrer, Friedrich, to Ciba-Geigy Corporation. Methylenedioxy substituted benzene derivatives. 4,094,989, Cl. 424-282.000.
Karrer, Friedrich; and Farooq, Saleem, to Ciba-Geigy Corporation. Ethers. 4,094,993, Cl. 424-337.000.
Karsten, Werner; and Erwien, Helmut, to Gewerkschaft Eisenhutte Westfalia. Anchoring apparatus for anchoring a mining installation. 4,094,157, Cl. 61-63.000.
Kartman, Helge C. C.: *See—*
Rasmussen, Poul; and Kartman, Helge C. C., 4,094,628, Cl. 432-80.000.
Kartridg Pak Co., The: *See—*
Rousseau, Roy Settle, 4,094,042, Cl. 17-46.000.
Kasama, Tsuneo: *See—*
Fujiyama, Hikaru; Kasama, Tsuneo; and Higuchi, Shigenobu, 4,094,028, Cl. 9-321.000.
Kashima, Yoshinobu: *See—*
Tanai, Kunio; Nakayama, Yasuaki; Hirai, Yoshiro; Aoyama, Shigeru; and Kashima, Yoshinobu, 4,095,129, Cl. 310-49.00R.
Kashimura, Toshisada: *See—*
Tomita, Makoto; Yokota, Hisaaki; Koga, Syozi; and Kashimura, Toshisada, 4,095,085, Cl. 219-123.000.
Kassel, Karl-Heinz: *See—*
Beschoner, Hans-Hermann; Guder, Gottfried; Dulken, Hartmut; and Kassel, Karl-Heinz, 4,094,675, Cl. 96-1.500.
Kataoka, Hiroyuki: *See—*
Suzuki, Kazuo; and Kataoka, Hiroyuki, 4,094,386, Cl. 187-29.00R.
Kataoka, Mitsuru: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Kitano, Noritoshi; and Mastuzawa, Toshiaki, 4,094,982, Cl. 424-263.000.
Katayama, Masatoshi: *See—*
Ohue, Hideki; and Katayama, Masatoshi, 4,094,140, Cl. 58-152.00R.
Katayama, Tsuyoshi: *See—*
Gotoh, Kazuhiko; Kawashima, Hiroshi; and Katayama, Tsuyoshi, 4,095,055, Cl. 179-18.0GF.
Kater, John A. R. Bio-event electrode material. 4,094,822, Cl. 252-512.000.
Kato, Kumiko: *See—*
Mizuno, Kinichi; Saito, Masao; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, 4,094,905, Cl. 260-561.00R.
Kato, Masumi: *See—*
Yamamoto, Akinori; and Kato, Masumi, 4,094,204, Cl. 74-230.17E.
Kato, Nobuharu: *See—*
Takeda, Shinji; Mitsui, Noriyoshi; and Kato, Nobuharu, 4,094,725, Cl. 156-497.000.
Katsimbas, Themistoklis, to Hoechst Aktiengesellschaft. Heat-curable pulverulent coating agent of a mixture of copolymers containing glycidyl groups and an adduct of aliphatic dicarboxylic acid and 2,4,6-tris(N',N'',N'''-dimethylaminomethyl)-phenol. 4,095,002, Cl. 427-27.000.
Kattner, Erich; Guntersdorfer, Max; and Heinzl, Joachim, to Siemens Aktiengesellschaft. Piezoelectric drive element for the printer heads used in ink-operated mosaic printer units. 4,095,238, Cl. 346-140.00R.
Katz, Seymour; and Brown, Victor R., to AGFA-GEVAERT. Light density scale imaging apparatus and method for using same. 4,095,111, Cl. 250-476.000.
Kaufer, Herbert: *See—*
Matthews, Larry Stanford; Kaufer, Herbert; and Sonstegard, David Ansel, 4,094,017, Cl. 3-1.911.
Kauffmann, Russell E. Channeled pivoting ball game with selective hole closure. 4,094,507, Cl. 273-110.000.
Kaufmann, Helmut: *See—*
Leisner, Ernst; Ulbricht, Wolfgang; and Kaufmann, Helmut, 4,094,339, Cl. 137-604.000.
Kaugars, Girts, to Upjohn Company, The. Alkanoyl chloride phenylhydrazones. 4,094,906, Cl. 260-566.00B.
Kautex Maschinenbau GmbH: *See—*
Daubenbuschel, Werner; Thomas, Alfred; Hess, Dieter; and Augst, Hans-Rudiger, 4,094,620, Cl. 425-140.000.
Kawabe, Shun; and Omoda, Kouichiro, to Hitachi, Ltd. Data processing system having a high speed buffer memory. 4,095,269, Cl. 364-200.000.
Kawamura, Koichi; and Kawamura, Yoshiko. Three dimensional display device using water fountain. 4,094,464, Cl. 239-17.000.
Kawamura, Yoshiko: *See—*
Kawamura, Koichi; and Kawamura, Yoshiko, 4,094,464, Cl. 239-17.000.
Kawasaki, Mikio: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, 4,094,682, Cl. 96-55.000.
Kawashima, Hiroshi: *See—*
Gotoh, Kazuhiko; Kawashima, Hiroshi; and Katayama, Tsuyoshi, 4,095,055, Cl. 179-18.0GF.
Kayama, Kunifusa: *See—*
Murayama, Seiichi; Yamamoto, Manabu; Ito, Masaru; Yasuda, Makoto; Watanabe, Makoto; and Kayama, Kunifusa, 4,095,142, Cl. 315-248.000.
Kazami, Koichi: *See—*
Imazeki, Kazuyoshi; and Kazami, Koichi, 4,095,190, Cl. 331-2.000.
Kazuo, Nakanishi, to Murata of America Inc. Thread end cutting apparatus in spinning machine. 4,094,134, Cl. 57-56.000.
Keiper KG: *See—*
Wirtz, Egon; and Berghaus, Klaus, 4,094,210, Cl. 74-553.000.
Kelley, Joseph T.: *See—*
Glassmeyer, John J.; and Kelley, Joseph T., 4,094,546, Cl. 296-28.00M.
Kellie, Truman F., to Minnesota Mining and Manufacturing Company. Holographic article and process for making same. 4,094,575, Cl. 350-3.670.
Kellner, Ferdinand. Bellows setting equipment. 4,095,246, Cl. 354-187.000.
Kellogg, Robert Melroy; and Mulzet, Alfred Paul, to International Business Machines Corporation. Centrifuge collecting chamber. 4,094,461, Cl. 233-40.000.
Kelly, Norman; Fletcher, William T.; Holden, Derek J.; and Welsh, James J., to Fiberglas Canada Limited. Apparatus for compressing and packaging articles. 4,094,130, Cl. 53-124.00D.
Kelly, Robert C., to Upjohn Company, The. 4,5-Didehydro-6-hydroxy-1β-arylmethoxymethyl-3α-tetrahydropyranacetic acid ε-lactones. 4,094,882, Cl. 260-343.000.
Kelly, Robert C., to Upjohn Company, The. 5-Iodo-6-oxo-3-(2'-arylmethoxy-1'-hydroxyethyl)-4-hydroxy-hexanoic acid, γ-lactone dialkyl acetals. 4,094,883, Cl. 260-343.600.
Kelly, Robert C., to Upjohn Company, The. 4α-Hydroxy-6-oxo-2β-arylmethoxy-methyl-3α-tetrahydropyranacetic acid γ-lactones. 4,094,884, Cl. 260-343.600.
Kelsey-Hayes Company: *See—*
Rozmus, Walter J., 4,094,709, Cl. 148-126.000.
Kemper, Ronald J. Sulfur gas removing and solid particle filter for well water. 4,094,789, Cl. 210-188.000.
Kemper, Yves Jean, to Vadetec Corporation. Piston stroke varying mechanism for expansible chamber energy conversion machines. 4,094,202, Cl. 74-60.000.
Kendall Company, The: *See—*
Marshall, Preston F., 4,095,007, Cl. 428-113.000.
Kennedy, Clyde. Pull tab beverage can opener. 4,094,435, Cl. 220-269.000.
Kennedy, Thomas W., Jr., to Sperry Rand Corporation. Side slip angle command SCAS for aircraft. 4,094,479, Cl. 244-179.000.
Kenrich Petrochemicals, Inc.: *See—*
Monte, Salvatore J.; and Sugerman, Gerald, 4,094,853, Cl. 260-40.00R.
Keogh, Raymond J.: *See—*
Burr, Robert Page; Morino, Ronald; and Keogh, Raymond J., 4,094,572, Cl. 339-97.00P.
Keprda, Jaroslav, to Siemens Aktiengesellschaft. Slide switch assembly

having terminals for mounting switch housing sidewall parallel to a printed circuit board. 4,095,060, Cl. 200-16.00D.

Kerr-McGee Corporation: *See—*
Thomas, David C., 4,094,810, Cl. 252-313.00R.

Kervizic, Jacques; and Hurt, Bernard, to C.G.R. MeV. Device for the magnetic correction of the trajectories of a beam of accelerated particles emerging from a cyclotron. 4,095,201, Cl. 335-210.000.

Kessler, Manfred, to Max Planck Gesellschaft. Method and an arrangement for continuously measuring the partial pressure of a gas in a sample. 4,094,305, Cl. 128-2.00E.

Ketterer, Stanley J.; and Edwards, William J., to Singer Company, The. Adjustable needle guard. 4,094,261, Cl. 112-228.000.

Keutzer, Larry L.: *See—*
Orr, F. D., Jr.; Templeton, L. F.; and Keutzer, Larry L., 4,095,115, Cl. 250-538.000.

Keyser, Naaman H.; and Cline, James C., to Interlake, Inc. Method of purifying silicon. 4,094,731, Cl. 156-616.00R.

Kiefer, Hans-Friedrich: *See—*
Mayer, Hermann; and Kiefer, Hans-Friedrich, 4,094,594, Cl. 352-91.00C.

Kiencke, Uwe: *See—*
Bremer, Wolfgang; Heintz, Frieder; Flaig, Ulrich; Kiencke, Uwe; and Glauert, Wolfram, 4,095,179, Cl. 324-207.000.

Kihara, Toshimasa, to Hitachi, Ltd. Instruction altering system. 4,095,278, Cl. 364-900.000.

Kikkoman Shoyu Co., Ltd.: *See—*
Aishima, Tetsuo; and Nobuhara, Akio, 4,094,997, Cl. 426-533.000.

Kilik, Ondrej: *See—*
Italy, Pavel; Kilik, Ondrej; Barancok, Jozef; and Miski, Anton, 4,094,144, Cl. 60-445.000.

Kimball, Stephen F.: *See—*
Hay, Warren H.; Kimball, Stephen F.; and Martin, Roy C., 4,095,207, Cl. 337-20.000.

Kime, Donald L.; and Stogdill, Ronald G., to Chemineer, Inc. Fully cartridge agitator seal for use with glass lined mixer tanks. 4,094,513, Cl. 277-41.000.

Kimura, Takashi: *See—*
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; and Yasuda, Atsushi, 4,094,996, Cl. 426-115.000.

Kindler, Hubert: *See—*
Hillekamp, Klaus; and Kindler, Hubert, 4,094,772, Cl. 209-12.000.

Kiner, Mark Winfield: *See—*
White, Bruce Lynn; Kiner, Mark Winfield; and Wiens, Arlen Jacob, 4,094,427, Cl. 214-505.000.
White, Bruce Lynn; Kiner, Mark Winfield; and Wiens, Arlen Jacob, 4,094,428, Cl. 214-505.000.

King, David W., to Gearhart-Owen Industries, Inc.; and Petro-Data C. A. Apparatus and methods for testing earth formations. 4,094,359, Cl. 166-65.00R.

King, Samuel A. Fluid motor. 4,094,227, Cl. 91-180.000.

Kinosz, Donald L.: *See—*
Cedro, Vito, III; Kinosz, Donald L.; and Lamberti, Thomas G., II, 4,094,815, Cl. 252-415.000.

Kinpara, Shinji: *See—*
Mito, Sanai; Kinpara, Shinji; Sumitomo, Yuji; and Kobayashi, Toshio, 4,095,234, Cl. 346-75.000.

Kirby, Thomas J., to GTE Sylvania Incorporated. Impedance-matching network. 4,095,198, Cl. 333-32.000.

Kirkhuff, Ellison H.; and Morris, James C., to GTE Sylvania Incorporated. Trigger circuit for flash lamp directly coupled to AC source. 4,095,140, Cl. 315-199.000.

Kirkman, Richard T.: *See—*
Colchagoff, Robert D.; Fortner, Paul W.; Kirkman, Richard T.; Naughton, Thomas J.; and Zimmerman, George, 4,094,656, Cl. 65-81.000.

Kirsch, Daniel D. Combination pipe and game device. 4,094,508, Cl. 273-118.00R.

Kishida, Katsuhiro; and Oyamada, Akira, to Nissan Motor Company, Ltd. Method of producing low wear coating reinforced with brazing solder for use as rubbing seal. 4,095,005, Cl. 427-376.00B.

Kiso, Shigemitsu: *See—*
Yasutake, Akira; and Kiso, Shigemitsu, 4,094,058, Cl. 29-592.00R.

Kitano, Noritoshi: *See—*
Morisawa, Yasuhiro; Kataoka, Mitsuru; Kitano, Noritoshi; and Mastuzawa, Toshiaki, 4,094,982, Cl. 424-263.000.

Kittler, Milton J. Resilient throttle stop means. 4,094,281, Cl. 123-98.000.

Klauser, John G., to Boston Digital Corporation. Digital servomechanism control system. 4,095,157, Cl. 318-603.000.

Klein, Howard P., to Texaco Development Corporation. Rigid polyurethane foams. 4,094,828, Cl. 260-2.5AM.

Klein, Yitzhak: *See—*
Inbar, Dan; and Klein, Yitzhak, 4,095,108, Cl. 250-369.000.

Kleinschmidt, Johann Otto; and Niem, Wolfgang, to Union Special G.m.b.H. Method and apparatus for automatic sewing. 4,094,260, Cl. 112-121.150.

Kley, Kurt Paul: *See—*
Felser, Hans-Josef; and Kley, Kurt Paul, 4,095,287, Cl. 366-194.000.

Klinge Pharma GmbH: *See—*
Schonenberger, Helmut; Kranzfelder, Gerhard; and Schmitt-Wallenborn, Helga, 4,094,994, Cl. 424-341.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Kramer, Peter, 4,094,545, Cl. 296-28.00C.
Welke, Helmut; and Tullius, Karl, 4,094,534, Cl. 280-760.000.

Knapp, Jutta: *See—*
Hadi, Ali Sameh Abdel; Reinhardt, Johann; and Knapp, Jutta, 4,094,953, Cl. 423-2.000.

Knauft, Guenter: *See—*
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Knauft, Guenter; Richter, Stephan; and Schulze-Schoelling, Hermann, 4,095,270, Cl. 364-200.000.

Knepper, Wilhelm; and Mueller, Dieter Juergen, to Chemische Werke Huels Aktiengesellschaft. Process for the preparation of sodium methallyl sulfonate. 4,094,898, Cl. 260-513.00B.

Knofel, Hartmut; and Ellendt, Gunther, to Bayer Aktiengesellschaft. Process for the preparation of polyamines. 4,094,907, Cl. 260-570.00D.

Knogo Corporation: *See—*
Minasy, Arthur J., 4,095,214, Cl. 340-258.00C.

Knorre, Helmut; Langer, Manfred; and Leidl, Peter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. D,L Tartaric acid as retardant for gypsum plaster. 4,094,693, Cl. 106-111.000.

Knox, Kenneth L., Sr. Carburetor checking and adjusting apparatus. 4,094,932, Cl. 261-41.00D.

Knox, Walter R.: *See—*
Hill, James C.; and Knox, Walter R., 4,094,865, Cl. 260-78.410.

Koa Oil Co., Ltd.: *See—*
Noguchi, Kosaku; Yoshimura, Kiyoharu; Tanaka, Honami; and Hayashi, Masao, 4,094,776, Cl. 210-27.000.

Kobayashi, Hiroshi; and Kuwabara, Nobuyoshi, to Chiyoda Chemical Engineering & Construction Co., Ltd. Multi layer sound-proofing structure. 4,094,380, Cl. 181-285.000.

Kobayashi, Shoji: *See—*
Takeda, Shinji; Kobayashi, Shoji; and Watanabe, Yutaka, 4,094,056, Cl. 29-527.200.

Kobayashi, Toshio: *See—*
Mito, Sanai; Kinpara, Shinji; Sumitomo, Yuji; and Kobayashi, Toshio, 4,095,234, Cl. 346-75.000.

Kobayashi, Yoshiki; Bandoh, Tadaaki; Maejima, Hideo; and Yasuda, Hajime, to Hitachi, Ltd. System for stopping and restarting the operation of a data processor. 4,095,268, Cl. 364-200.000.

Kobe Steel, Limited: *See—*
Tomita, Makoto; Yokota, Hisaaki; Koga, Syozi; and Kashimura, Toshisada, 4,095,085, Cl. 219-123.000.

Kober, Frederick P., to Chem-E-Watt Corporation. Separator in electrochemical heating element. 4,094,298, Cl. 126-263.000.

Koch, Harold S.: *See—*
Hyams, Irving; Koch, Harold S.; and Aafjes, Herman, 4,094,212, Cl. 81-3.800.

Koder, Walter; and Hillmann, Reinhart, to SKF Kugellagerfabriken GmbH. Clutch throw-out device. 4,094,394, Cl. 192-98.000.

Koenig, Karl-Heinz: *See—*
Mangold, Dietrich; Koenig, Karl-Heinz; and Reitel, Christian, 4,095,034, Cl. 560-134.000.

Koga, Syozi: *See—*
Tomita, Makoto; Yokota, Hisaaki; Koga, Syozi; and Kashimura, Toshisada, 4,095,085, Cl. 219-123.000.

Kogan, Rita Moiseevna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

Koh, Kwang K.; Nahas, Nicholas C.; Pennington, Robert E.; and Vernon, Lonnie W., to Exxon Research & Engineering Co. Integrated catalytic gasification process. 4,094,650, Cl. 48-197.00R.

Kohama, Haruo: *See—*
Sumimoto, Mitsuhiro; and Kohama, Haruo, 4,094,642, Cl. 23-254.00R.

Koike, Koso: *See—*
Kakui, Kuniaki; Shigeta, Toshihiko; and Koike, Koso, 4,094,618, Cl. 418-178.000.

Kokuku Chemical Industry Co. Ltd.: *See—*
Fujiyama, Hikaru; Kasama, Tsuneo; and Higuchi, Shigenobu, 4,094,028, Cl. 9-321.000.

Kolker, Carl R.; Campbell, John Scott; La Fond, Robert L.; and Smith, JaMi, to Faxon Communications Corporation, by said Kolker, Campbell and LaFond. Redundancy reduction system for facsimile transceivers. 4,095,248, Cl. 358-288.000.

Kollmorgen Technologies, Inc.: *See—*
Burr, Robert Page; Morino, Ronald; and Keogh, Raymond J., 4,094,572, Cl. 339-97.00P.

Kolpakov, Serafim Vasilievich; Gurkov, Zinovy Lvovich; Bondarenko, Oleg Leonidovich; Valtsov, Vladimir Viktorovich; Pozhivanov, Alexandr Mikhailovich; Gugnin, Eduard Dmitrievich; Radilov, Stanislav Vyacheslavovich; and Bogdanov, Alexandr Andreevich. Method and apparatus for lining ladles. 4,094,938, Cl. 264-30.000.

Komamura, Takeo; Okamoto, Tadao; and Ishihama, Atsumi. Intra-uterine device and tool for insertion of same. 4,094,313, Cl. 128-130.000.

Komuro, Katsu: *See—*
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; and Komuro, Katsu, 4,094,385, Cl. 187-29.00R.

Kondo, Kiyosi; and Tunemoto, Daiei, to (Zaidanhojin) Sagami Chemi-

cal Research Center. Process for producing allyl alcohol derivatives useful in prostaglandin synthesis. 4,094,886, Cl. 260-345.90P.

Kondo, Yojiro; and Ohta, Yoshinori, to Nippon Electric Co., Ltd. Acoustooptic device. 4,094,583, Cl. 350-358.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Masukawa, Toyoaki; Kawasaki, Mikio; and Kaneko, Yutaka, 4,094,682, Cl. 96-55.000.

Kopparfors AB: *See*—
Holgersson, Sigbjorn P. H. E., 4,094,735, Cl. 162-76.000.

Koranda, Clarence J. Lock for railway hopper car gate railway car gate lock. 4,094,254, Cl. 105-282.00P.

Kores Holding Zug AG: *See*—
Koreska, Peter, 4,094,343, Cl. 141-86.000.

Koreska, Peter, to Kores Holding Zug AG. Sliding cover for duplicating fluid receptacles. 4,094,343, Cl. 141-86.000.

Korzeniewski, Eugene C.: *See*—
Moran, Kevin E.; and Korzeniewski, Eugene C., 4,095,120, Cl. 290-44.000.

Kossler, Edgar. Perforated doctor roll. 4,094,241, Cl. 101-120.000.

Kossoff, George, to Commonwealth of Australia, c/o The Department of Health, The. Apparatus for ultrasonic examination. 4,094,306, Cl. 128-2.00V.

Kosters, Egon: *See*—
Holper, Manfred; Schertel, Gunter; and Kosters, Egon, 4,094,256, Cl. 108-50.000.

Koyo Seiko Company Limited: *See*—
Okuda, Hiroji; and Narikiyo, Hiroyoshi, 4,094,174, Cl. 72-238.000.
Okuda, Hiroji, 4,094,179, Cl. 72-238.000.

Kramer, Peter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Vehicle cab structure, especially for the tractors of the agricultural or construction type. 4,094,545, Cl. 296-28.00C.

Kranzfelder, Gerhard: *See*—
Schonenberger, Helmut; Kranzfelder, Gerhard; and Schmitt-Wallenborn, Helga, 4,094,994, Cl. 424-341.000.

Kratzer, Dale L., to Harris Corporation. System for communication. 4,095,226, Cl. 343-105.00R.

Krauss-Maffei Aktiengesellschaft: *See*—
Hillekamp, Klaus; and Kindler, Hubert, 4,094,772, Cl. 209-12.000.

Kressel, Henry: *See*—
Hawrylo, Frank Zygmunt; and Kressel, Henry, 4,095,011, Cl. 428-469.000.

Krieg, Adrian H., to Widder Corporation. Tool mounting apparatus. 4,094,612, Cl. 408-92.000.

Krieger, Heinrich. Arrangement for cooling fluids. 4,094,655, Cl. 62-40.000.

Kronseder, Hermann; Dullinger, Karl; and Matzinger, Kurt, to Kronseder, Hermann. Apparatus for conveying upright standing containers and rejecting abnormal containers. 4,094,411, Cl. 209-97.000.

Kroposki, Lorraine M.; Yoshimine, Masao; and Freedman, Harold H., to Dow Chemical Company, The. Process for preparing phosphorothioates and phenylphosphonothioates. 4,094,873, Cl. 544-243.000.

Krueger, Friedrich; and Michel, Walter, to Joh. A. Benckiser. N-acyl-1-amino alkane-1,1-diphosphonic acid compounds and compositions for and method of using same. 4,094,782, Cl. 210-58.000.

Kruger, Rolf, to O and K Orenstein & Koppel Aktiengesellschaft. Handling plant for dumping and discharging bulk materials. 4,094,419, Cl. 214-10.000.

Krupp-Koppers GmbH: *See*—
Waldhofer, Reinhard, 4,094,470, Cl. 241-46.00R.

Kubichan, Robert E.: *See*—
Gillery, Frank H.; Pressau, Jean P.; and Kubichan, Robert E., 4,094,763, Cl. 204-192.00P.

Kubler, John M.: *See*—
Holdren, Frederick V.; Hugli, Hans W.; Kubler, John M.; Larson, Martin E.; and Van Schoiack, Michael M., 4,094,199, Cl. 73-517.00B.

Kubota, Munetaka: *See*—
Fujita, Hiroshi; Kubota, Munetaka; Makita, Takashi; and Takahashi, Yukishige, 4,094,151, Cl. 61-36.00A.

Kudinova, Sofya Ivanovna: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

Kueny, Kenneth E., to Johnson Products Div. of Sealed Power Corporation. Ductile iron roller tappet body and method for making same. 4,094,279, Cl. 123-90.510.

Kuepper, Friedrich-Wilhelm, to Chemische Werke Huels Aktiengesellschaft. Process for the polymerization of cycloolefins. 4,095,033, Cl. 526-90.000.

Kuhlmann, Wolf: *See*—
Lang, Gusztav; and Kuhlmann, Wolf, 4,094,222, Cl. 85-63.000.

Kuhn, Franz Josef: *See*—
Weber, Karl-Heinz; Bauer, Adolf; Danneberg, Peter; and Kuhn, Franz Josef, 4,094,984, Cl. 424-269.000.

Kunzmann, Otto, to Bielomatik Leuze & Co. Apparatus for the folding of paper webs or similar materials. 4,094,500, Cl. 270-79.000.

Kupperman, Dennis: *See*—
Kupperman, Sam; and Kupperman, Dennis, 4,094,091, Cl. 46-53.000.

Kupperman, Sam; and Kupperman, Dennis, to R B Toy Development Co. Integrally formed plastic spinner toy unit with means for attaching same to a support. 4,094,091, Cl. 46-53.000.

Kuraishi, Kaoru, to Toshiba Photo Products Co., Ltd. Adapter for electronic flash apparatus. 4,095,245, Cl. 354-141.000.

Kurita, Masaru: *See*—
Tanaka, Kunihiko; Kurita, Masaru; and Nishiwaki, Osamu, 4,094,872, Cl. 544-26.000.

Kurnit, Norman A.: *See*—
Begley, Richard F.; and Kurnit, Norman A., 4,095,121, Cl. 307-88.300.

Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Shin-ichi, to Nissan Motor Company, Ltd. Internal combustion engine and method of reducing toxic compounds in the exhaust gases therefrom. 4,094,286, Cl. 123-119.00A.

Kusada, Shohei; and Kaneko, Tomoyoshi, to Kabushiki Kaisha Komatsu Seisakusho. Die apparatus for press machine. 4,094,182, Cl. 72-344.000.

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Shibata, Nobuho; Seri, Tutomu; Umezawa, Norio; and Morofuji, Takeshi, 4,095,166, Cl. 323-17.000.
Matsushita Electronics Corporation: *See—*
Yamazaki, Haruo; and Akutsu, Hidezoh, 4,095,135, Cl. 313-493.000.
Matsuura, Tsuneharu: *See—*
Hatanaka, Shiro; Tamesui, Tsuyoshi; and Matsuura, Tsuneharu, 4,094,105, Cl. 51-101.00R.
Matsuzaka Iron Works, Inc.: *See—*
Nishikawa, Hideichi; and Sakamoto, Masaharu, 4,094,064, Cl. 30-92.000.
Matthews, Larry Stanford; Kaufer, Herbert; and Sonstegard, David Ansel. Knee joint prosthesis with patellar-femoral contact. 4,094,017, Cl. 3-1.911.

Matty, Thomas C.; and Franz, James H., Jr., to Westinghouse Electric Corp. Transit vehicle electrical brake control apparatus and method. 4,095,153, Cl. 318-376.000.

Matura, Joseph R., to United States of America, Army. Parachute flare having a variable burn rate. 4,094,245, Cl. 102-35.000.

Matzinger, Kurt: *See*—
Kronseder, Hermann; Dullinger, Karl; and Matzinger, Kurt, 4,094,411, Cl. 209-97.000.

Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Sirrenberg, Wilhelm; Hammann, Ingeborg; Homeyer, Bernhard; and Thomas, Herbert, to Bayer Aktiengesellschaft. O-alkyl-O-chloromethylsulfonylphenyl-thionophosphonic acid esters and nematicidal and arthropodicidal use. 4,094,975, Cl. 424-216.000.

Mavrovic, Ivo. Urea synthesis with improved heat recovery and conversion. 4,094,903, Cl. 260-555.00A.

Max Co., Ltd.: *See*—
Nishikawa, Mitsuo; Hosaka, Hideo; and Maemori, Jun, 4,094,342, Cl. 140-93.200.

Max Planck Gesellschaft: *See*—
Kessler, Manfred, 4,094,305, Cl. 128-2.00E.

Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v.: *See*—
Ruhenstroth-Bauer, Gerhard; and Scherer, Reiner, 4,094,759, Cl. 204-180.00G.

May, Michael G. Externally ignited four cycle internal combustion engine. 4,094,272, Cl. 123-30.00D.

Mayer, Hans Johann: *See*—
Boguth, Walter; Leuenberger, Hans Georg Wilhelm; Mayer, Hans Johann; Widmer, Erich; and Zell, Reinhard, 4,095,038, Cl. 560-255.000.

Mayer, Hermann; and Kiefer, Hans-Friedrich, to Robert Bosch GmbH. Movie-camera with automatic fade-out shutoff. 4,094,594, Cl. 352-91.00C.

Mayer, Ivan: *See*—
Siskin, Michael; and Mayer, Ivan, 4,094,924, Cl. 260-683.510.

Mayhew, Harry E., Jr.: *See*—
Schlegel, William R.; and Mayhew, Harry E., Jr., 4,094,143, Cl. 60-352.000.

Mayo, Haydn Frank: *See*—
Wilkins, John Thomas; and Mayo, Haydn Frank, 4,094,034, Cl. 15-49.00R.

McBride, Edward J., Jr. Tension device for horizontal yarn. 4,094,477, Cl. 242-152.100.

McCoomb, John Michael, to Spintiller International Limited. Cultivating implements. 4,094,363, Cl. 172-349.000.

McCord, Kenneth C.: *See*—
Sgroi, Ronald, 4,094,357, Cl. 165-105.000.

McEachern, Robert A.; and Cavigelli, George A., to American Optical Corporation. Apparatus for enhanced display of physiological waveforms and for defibrillation. 4,094,310, Cl. 128-2.06G.

McElvey, Sylvia C. Animal halter. 4,094,131, Cl. 54-24.000.

McEntire, Edward E., to Texaco Development Corporation. Substituted ureas as polyurethane catalysts. 4,094,827, Cl. 260-2.5AC.

McGaha, Patrick L.: *See*—
Nangle, Bernard; McGaha, Patrick L.; Wallace, Thomas J.; and Anderson, Todd B., 4,095,119, Cl. 290-40.00R.

McGinniss, Vincent Daniel, to SCM Corporation. Aqueous coating composition and process from a mercaptan containing polymer and a bis-maleimide. 4,094,843, Cl. 260-29.20N.

McGuire, Samuel B.: *See*—
Stange, Ronald R.; McGuire, Samuel B.; and Woodring, Thomas W., 4,094,749, Cl. 204-25.000.

McKenzie, John Matthew: *See*—
Toal, Desmond J.; McKenzie, John Matthew; and Hemby, Franklin Delano, 4,094,550, Cl. 301-37.00R.

McLeod, Fenwick R., Jr., to Sun Electric Corporation. Tachometer circuit. 4,095,178, Cl. 324-169.000.

McMahon, Donald H.; and Nelson, Arthur R., to Sperry Rand Corporation. Multimode optical waveguide device with non-normal butt coupling of fiber to electro-optic planar waveguide. 4,094,579, Cl. 350-96.170.

McMillan, Ronald J., to Raymond Lee Organization, Inc., The, a part interest. Deodorizer. 4,094,639, Cl. 21-74.00R.

McVicker, Gary B.; and Garten, Robert L., to Exxon Research & Engineering Co. Catalysts and method of their preparation. 4,094,821, Cl. 252-466.0PT.

Mead Corporation, The: *See*—
Cha, Charles L., 4,095,232, Cl. 346-75.000.
Zietzschmann, Jurgen, 4,094,406, Cl. 206-432.000.

Mead Johnson & Company: *See*—
Wu, Yao Hua; and Lobeck, Walter G., Jr., 4,094,981, Cl. 424-257.000.

Mead, Louis W.: *See*—
Deutsch, Marshall E.; and Mead, Louis W., 4,094,647, Cl. 23-253.0TP.

Medicor Muvek: *See*—
Nagy, Ferenc, 4,095,117, Cl. 250-564.000.

Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, to Burroughs Wellcome Co. 2-Carbalkoxy-2'-aminocarbonyldiphenyl sulfides. 4,095,027, Cl. 560-18.000.

Meinan Machinery Works, Inc.: *See*—
Hasegawa, Katsuji, 4,094,344, Cl. 141-125.000.

Meinke, Hans Heinrich; Lindenmeier, Heinz; Landstorfer, Friedrich; Flachenecker, Gerhard; and Hopf, Jochen, to Hans Kolbe & Co. Windshield antenna defroster combination with radio interference reduction. 4,095,228, Cl. 343-704.000.

Mellor, Joachim, to Buhler-Miag GmbH. Arrangement for pneumatic transporting of materials. 4,094,552, Cl. 302-29.000.

Mendelsohn, Charles, to United Technologies Corporation. Mask-less single electron gun, color crt. 4,095,144, Cl. 315-375.000.

Mendenhall, Robert L. Direct heating asphalt-aggregate recycle apparatus and method. 4,095,284, Cl. 366-7.000.

Mentrup, Anton: *See*—
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Frolke, Wilhelm, 4,094,980, Cl. 424-250.000.

Mercik, Henry J., Jr.: *See*—
Goetsch, Henry E.; and Mercik, Henry J., Jr., 4,094,191, Cl. 73-118.000.

Merck & Co., Inc.: *See*—
Dybas, Richard A.; Graham, Donald W.; and Brown, Jeannette E., 4,094,976, Cl. 424-228.000.
Wendler, Norman L.; Girotra, Narindar N.; and Zelawski, Zbigniew S., deceased, 4,094,878, Cl. 260-297.00Z.

Messerschmitt, David Gavin: *See*—
Ching, Yau-Chau; and Messerschmitt, David Gavin, 4,095,052, Cl. 179-15.0AS.

Meszaros, Csilla: *See*—
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,094,908, Cl. 260-570.00R.

Metal Research Corporation: *See*—
Ototani, Tohei, 4,094,666, Cl. 75-58.000.

Metallisation Limited: *See*—
Ashman, Stewart John, 4,095,081, Cl. 219-76.160.

Mettler, Karl, to Press- & Stanzwerk AG. Method of fabricating a substantially U-shaped body and apparatus for the performance thereof. 4,094,183, Cl. 72-356.000.

Mevel, Yves: *See*—
Anizan, Pierre; Ducournau, Jean Paul; Gilberton, Paul; and Mevel, Yves, 4,095,054, Cl. 179-18.0ES.

Meye, Reinhold Walter: *See*—
Finkensiep, Friedhelm; Meye, Reinhold Walter; and Thor, Gunter, 4,094,946, Cl. 264-171.000.

Meyer, Jeffry R.; and Hess, Robert L., to Westinghouse Electric Corp. Stationary-contact-and voltage-shield assembly for a gas-puffer-type circuit-interrupter. 4,095,068, Cl. 200-144.0AP.

Meyer, Larry P., to Nelson Irrigation Corporation. Sprinkler head selectively operable in a part-circle mode or a full circle mode. 4,094,467, Cl. 239-230.000.

Meyre, Rene Wilhelm: *See*—
Frazier, Thomas Cecil; Ashworth, John Thomas; Chumney, Richard Douglas, Jr.; and Meyre, Rene Wilhelm, 4,094,323, Cl. 131-8.00R.

MFB Neuwerk GmbH: *See*—
Bemthin, Johannes, 4,094,018, Cl. 4-7.000.

Michel, Eberhard: *See*—
Greischel, Christoph; Harand, Elmar; Maritsch, Franz; and Michel, Eberhard, 4,094,737, Cl. 176-65.000.

Michel, George P.: *See*—
Schroeder, Stephen M.; and Michel, George P., 4,095,205, Cl. 336-92.000.

Michel, Walter: *See*—
Krueger, Friedrich; and Michel, Walter, 4,094,782, Cl. 210-58.000.

Mickelson, Grant A., to Union Oil Company of California. Manufacture of cobalt and/or nickel-molybdenum-alumina catalysts. 4,094,820, Cl. 252-465.000.

Miles, Larry L., to Texas Instruments Incorporated. Synchronous state counter. 4,095,093, Cl. 235-92.0GT.

Milewski, Sylvester, to Honeywell Inc. System having reset action. 4,094,463, Cl. 236-82.000.

Miller, Larry E., to J. I. Case Company. Combination low ground pressure, low turning resistance and self-cleaning track shoe. 4,094,557, Cl. 305-54.000.

Miller, Paul D.; and Porcelli, V. Lorenzo, to GAF Corporation. Combined display and shipping package. 4,094,404, Cl. 206-45.150.

Miller, Ralph, to Ciba-Geigy Corporation. Process for the separation of NH_3 from a gaseous mixture containing NH_3 and HCN. 4,094,958, Cl. 423-238.000.

Miller, Richard L. Boat trailer. 4,094,527, Cl. 280-414.00R.

Milnes, Arthur G. Dual electrically insulated solar cells. 4,094,704, Cl. 136-89.0TF.

Milo, Joseph V., to Universal Valve Co., Inc. Tank manifold. 4,094,346, Cl. 141-286.000.

Milton, Clare L., Jr. Oven system. 4,094,627, Cl. 432-59.000.

Minasy, Arthur J., to Knogo Corporation. Electronic monitoring system and responder device. 4,095,214, Cl. 340-258.00C.

Mineral Concentrates & Chemical Company, Inc.: *See*—
Brown, Harold, 4,094,769, Cl. 208-11.00R.

Minick, Harold N.: *See*—
Wolff, Douglas F.; Minick, Harold N.; and Reinhart, Jay J., 4,094,561, Cl. 312-223.000.

Minigrip, Inc.: *See*—
Boccia, Salvatore, 4,094,729, Cl. 156-515.000.

Minnesota Mining and Manufacturing Company: *See*—
Burger, Thomas J., 4,095,013, Cl. 428-522.000.
Kellie, Truman F., 4,094,575, Cl. 350-3.670.
Mitsch, Ronald A.; and Zollinger, Joseph La Mar, 4,094,911, Cl. 260-615.00A.

Minolta Camera Kabushiki Kaisha: *See*—
Miura, Jiro, 4,095,249, Cl. 354-288.000.

Minton, Keith G., to Hoover Company, The. Conductive hose and ends. 4,094,535, Cl. 285-7.000.

Miski, Anton: *See*—
Italy, Pavel; Kilik, Ondrej; Barancok, Jozef; and Miski, Anton, 4,094,144, Cl. 60-445.000.
Miskovic, Mihajlo: *See*—
Baudin, Cecile; Miskovic, Mihajlo; Polton, Alain; and Sigwalt, Pierre, 4,094,830, Cl. 260-4.00R.
Mississippi Chemical Corporation: *See*—
Cook, Toby M.; Tucker, Gerald L.; and Brown, Marion L., 4,094,643, Cl. 23-285.000.
Mito, Sanai; Kinpara, Shinji; Sumitomo, Yuji; and Kobayashi, Toshio, to Sharp Kabushiki Kaisha. Recording apparatus for providing lustrous printing. 4,095,234, Cl. 346-75.000.
Mitsch, Ronald A.; and Zollinger, Joseph La Mar, to Minnesota Mining and Manufacturing Company. Poly(perfluoroalkylene oxide) derivatives. 4,094,911, Cl. 260-615.00A.
Mitsubishi Chemical Industries, Ltd.: *See*—
Tanabe, Yasuo, 4,094,887, Cl. 260-346.110.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Miyamoto, Teruo; Ishii, Toshiji; Miura, Yoshikazu; and Nitta, Tohei, 4,095,204, Cl. 336-57.000.
Tsumori, Akihiro; and Shima, Kenji, 4,095,076, Cl. 219-10.49R.
Mitsubishi Gas Chemical Company, Ltd: *See*—
Mizuno, Kinichi; Saito, Masao; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, 4,094,905, Cl. 260-561.00R.
Mitsui Mining Co., Ltd.: *See*—
Shoji, Kouichi; and Grimley, Arthur W. T. (said Kouichi Shoji assors. to), 4,094,549, Cl. 299-17.000.
Mitsui Mining and Smelting Co., Ltd.: *See*—
Morimoto, Toshiki, 4,094,055, Cl. 29-527.600.
Mitsui, Nobuo: *See*—
Maeda, Yasuyuki; Mitsui, Nobuo; Kameyama, Tadao; and Komuro, Katsu, 4,094,385, Cl. 187-29.00R.
Mitsui, Noriyoshi: *See*—
Takeda, Shinji; Mitsui, Noriyoshi; and Kato, Nobuharu, 4,094,725, Cl. 156-497.000.
Mitsui Toatsu Chemicals Inc.: *See*—
Iwai, Yasuto; Okabe, Masayoshi; Seki, Naotoshi; Hiai, Atsuhiko; and Iguchi, Seiya, 4,094,780, Cl. 210-38.00B.
Miura, Jiro, to Minolta Camera Kabushiki Kaisha. Film cartridge ejecting device for a camera. 4,095,249, Cl. 354-288.000.
Miura, Yoshikazu: *See*—
Miyamoto, Teruo; Ishii, Toshiji; Miura, Yoshikazu; and Nitta, Tohei, 4,095,204, Cl. 336-57.000.
Miyamoto, Teruo; Ishii, Toshiji; Miura, Yoshikazu; and Nitta, Tohei, to Mitsubishi Denki Kabushiki Kaisha. Transformer having forced oil cooling system. 4,095,204, Cl. 336-57.000.
Mizuno, Kinichi; Saito, Masao; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, to Mitsubishi Gas Chemical Company, Ltd. Process for producing dimethyl formamide. 4,094,905, Cl. 260-561.00R.
Mobil Oil Corporation: *See*—
Kaeding, Warren W.; and Young, Lewis B., 4,094,921, Cl. 260-671.00C.
Modular Products: *See*—
Fund, Harry, 4,094,083, Cl. 40-536.000.
Moeglich, Karl, to Westinghouse Electric Corporation. Water purification method. 4,094,755, Cl. 204-149.000.
Moinard, Michel; Leturcq, Michel; and Delcroix, Catherine, to Societe Nationale Elf Aquitaine. Submerged apparatus and method for submersing the same. 4,094,161, Cl. 61-95.000.
Molex Incorporated: *See*—
Ditzig, Albert F., 4,095,089, Cl. 219-441.000.
Moll, Franz: *See*—
Botta, Artur; von Konig, Anita; Moll, Franz; Rasp, Christian; and Hartl, Johannes, 4,094,811, Cl. 252-313.00R.
Molyneux, Alan: *See*—
Maes, Jean Pierre; and Molyneux, Alan, 4,095,176, Cl. 324-65.0CR.
Monarch Marking Systems, Inc.: *See*—
Neubauer, Gilbert A., 4,094,438, Cl. 221-1.000.
Monsanto Company: *See*—
Alt, Gerhard H.; and Franz, John E., 4,094,661, Cl. 71-88.000.
Gaertner, Van Russell, 4,094,928, Cl. 260-944.000.
Haynes, Richard T.; and Young, Harry L., 4,094,851, Cl. 260-33.6UA.
Hill, James C.; and Knox, Walter R., 4,094,865, Cl. 260-78.410.
Morgan, Albert W.; Moorman, David S.; and Vanderlinde, William, 4,094,850, Cl. 260-31.8PQ.
Montague, Herbert R., to Control Concepts Corporation. Transient voltage suppression circuit. 4,095,163, Cl. 323-8.000.
Monte, Salvatore J.; and Sugerman, Gerald, to Kenrich Petrochemicals, Inc. Alkoxy titanate salts useful as coupling agents. 4,094,853, Cl. 260-40.00R.
Mooney, David H., Jr., to Westinghouse Electric Corp. Post-detection STC in a medium PRF pulse doppler radar. 4,095,222, Cl. 343-7.00A.
Moore, Desmond F.: *See*—
Byrne, Peter Cyril; and Moore, Desmond F., 4,094,555, Cl. 303-100.000.
Moore, Vincent; and Levesque, Paul N., to Altair, Inc.; and American Sterilizer Company. Retractable toilet bowl assembly. 4,094,019, Cl. 4-312.000.
Moorman, David S.: *See*—
Morgan, Albert W.; Moorman, David S.; and Vanderlinde, William, 4,094,850, Cl. 260-31.8PQ.
Moracchioli, Robert: *See*—
Alleau, Thierry; and Moracchioli, Robert, 4,094,147, Cl. 60-641.000.
Morain, Eldon W.: *See*—
Cole, Judson C.; and Morain, Eldon W., 4,094,536, Cl. 285-21.000.
Moran, Kevin E.; and Korzeniewski, Eugene C., to Glick, Louis Michael. Load control for wind-driven electric generators. 4,095,120, Cl. 290-44.000.
Moraru, Dinu Stefan; Pitis, Ion; and Bogos, Constantin, to Institutul de Cercetari in Constructii si Economia Constructiilor. Mortar for anticondensate, antimoisture, heat-insulating, and biocidal plaster. 4,094,691, Cl. 106-95.000.
Morgan, Albert W.; Moorman, David S.; and Vanderlinde, William, to Monsanto Company. Flame retardant composition. 4,094,850, Cl. 260-31.8PQ.
Morimoto, Takao, to Tokyo Electric Co., Ltd. Clock pulse control system for microcomputer systems. 4,095,267, Cl. 364-200.000.
Morimoto, Toshiki, to Mitsui Mining and Smelting Co., Ltd. Automatic working method of castings. 4,094,055, Cl. 29-527.600.
Morino, Ronald: *See*—
Burr, Robert Page; Morino, Ronald; and Keogh, Raymond J., 4,094,572, Cl. 339-97.00P.
Morisawa, Yasuhiro; Kataoka, Mitsuru; Kitano, Noritoshi; and Mastuzawa, Toshiaki, to Sankyo Company Limited. Pyridine sulfonamides and their use as anticoccidial agents. 4,094,982, Cl. 424-263.000.
Morley, James P.; and Woods, William J., to Chicago Rawhide Manufacturing Company. Track pin assemblies and seal therefor. 4,094,516, Cl. 277-92.000.
Morofuji, Takeshi: *See*—
Shibata, Nobuho; Seri, Tutomu; Umezawa, Norio; and Morofuji, Takeshi, 4,095,166, Cl. 323-17.000.
Morokawa, Shigeru, to Citizen Watch Company Limited. Voltage conversion system for electronic timepiece. 4,094,137, Cl. 58-23.00A.
Morokawa, Shigeru: *See*—
Nomura, Yasushi; and Morokawa, Shigeru, 4,094,135, Cl. 58-23.00R.
Morris, Guy V.: *See*—
Dounce, Eric A.; and Morris, Guy V., 4,095,224, Cl. 343-17.10R.
Morris, James C.: *See*—
Kirkhuff, Ellison H.; and Morris, James C., 4,095,140, Cl. 315-199.000.
Morrison, Howard J.; and Hicks, Alan A., to Marvin Glass & Associates. Competitive game. 4,094,506, Cl. 273-85.00R.
Morrow, Richard H.: *See*—
Fegley, Charles R.; Morrow, Richard H.; and Naylor, Arthur G., 4,094,410, Cl. 209-73.000.
Mortimer, Thomas J., to Sanders Associates, Inc. Pager subsystems. 4,095,215, Cl. 340-311.000.
Morton, Douglas Ross, Jr., to Upjohn Company, The. Cis-13-9-deoxy-9,10-didehydro-PGD_2 compounds. 4,094,891, Cl. 260-413.000.
Morton, Michael John, to Imperial Chemical Industries Limited. Liquid composition. 4,094,690, Cl. 106-73.400.
Morton-Norwich Products, Inc.: *See*—
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Moschner, John L., to NCR Corporation. Method and means for providing and testing secure identification data. 4,094,462, Cl. 235-419.000.
Moss, Philip H.: *See*—
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Motorola, Inc.: *See*—
Dounce, Eric A.; and Morris, Guy V., 4,095,224, Cl. 343-17.10R.
Wilson, Richard W., 4,094,761, Cl. 204-192.00M.
Motoya, Junichi: *See*—
Araya, Kumakichi; and Motoya, Junichi, 4,094,515, Cl. 277-92.000.
Moulinoux, Andre, to Facom. Machine for balancing a body of revolution. 4,094,198, Cl. 73-460.000.
Mountz, John M. Wheel slip correction method, system and apparatus. 4,095,147, Cl. 318-52.000.
Mourick, Paul, to Siemens Aktiengesellschaft. Circuit arrangement for an a-c series motor. 4,095,151, Cl. 318-266.000.
Moyer, David F.: *See*—
Auiler, James E.; Hamburg, Douglas R.; Hyland, James E.; and Moyer, David F., 4,094,275, Cl. 123-34.00A.
Mueller, Dieter Juergen: *See*—
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Mueller, Henry F. W. Moisturized air-filter for internal combustion engines. 4,094,930, Cl. 261-18.00A.
Mueller, William A., to California Institute of Technology. Dialysis system. 4,094,775, Cl. 210-22.000.
Muhs, Reinhard: *See*—
Stollenwerk, Joseph August; and Muhs, Reinhard, 4,094,474, Cl. 242-56.200.
Muijs, Cornelis G. M.: *See*—
Decoene, Frans J. G. C.; Muijs, Cornelis G. M.; Van Eecke, Roger H.; and Vansteelant, Marc G., 4,094,132, Cl. 56-14.400.
Mukoyama, Yoshiyuki: *See*—
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Mulder, Rudolf; and Wellinga, Kobus, to U.S. Philips Corporation. Pyrazoline compounds having insecticidal activity. 4,095,026, Cl. 548-379.000.
Mulhauser, Paul J.: *See*—
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Muller, Hans Rudolf, to Sundstrand Data Control, Inc. Aircraft pitch attitude signal generator. 4,095,271, Cl. 364-434.000.
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Kutscherauer, Andreas; and Muller, Ortwin, 4,094,593, Cl. 351-38.000.
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Muller, Wolfgang: *See—*
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Mulzet, Alfred Paul: *See—*
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Munk, Torben; and Ehrenskjold, Nils Oluf, to Gori-Vaerk A/S. Propeller. 4,094,614, Cl. 416-140.000.
Munkedals Aktiebolag: *See—*
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Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, to Nippon Shinyaku Co., Ltd. Substituted N-(carboxymethyl)-3-aminopropan-2-ol derivatives. 4,094,991, Cl. 424-309.000.
Muraoka, Hisashi; and Yoneyama, Teruo, to Tokyo Shibaura Electric Co., Ltd. Apparatus for manufacturing semiconductor devices. 4,095,095, Cl. 235-419.000.
Murata of America Inc.: *See—*
Kazuo, Nakanishi, 4,094,134, Cl. 57-56.000.
Murayama, Seiichi; Yamamoto, Manabu; Ito, Masaru; Yasuda, Makoto; Watanabe, Makoto; and Kayama, Kunifusa, to Hitachi, Ltd. High frequency discharge lamp for a spectral-line source. 4,095,142, Cl. 315-248.000.
Murphy, F. J.: *See—*
Terranova, A. P.; and Murphy, F. J., 4,095,145, Cl. 315-383.000.
Murr, John Leroy. Apparatus for cutting hay baler twine. 4,094,239, Cl. 100-5.000.
Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation process using multi-metallic zeolite catalyst. 4,094,918, Cl. 260-668.00R.
Murtha, Timothy P.; and Zuech, Ernest A., to Phillips Petroleum Company. Hydroalkylation using multi metallic zeolite catalyst. 4,094,920, Cl. 260-668.00R.
Muse, Louis Marcel, to General Electro-Magnetic Prospecting, Inc. Method for locating discontinuities in the electrical conductivity of the sub-soil using a plurality of magnetic detectors in a predetermined spatial arrangement. 4,095,169, Cl. 324-8.000.
Musso, Giuseppe: *See—*
Cocuzza, Gioacchino; and Musso, Giuseppe, 4,094,962, Cl. 423-573.00R.
Muszumanski, Trude: *See—*
Besenmatter, Walter; and Muszumanski, Trude, 4,094,587, Cl. 350-184.000.
Muto, Rudolph. Shallow, dome-shaped pacer with bottom storage means for catheter. 4,094,321, Cl. 128-419.00P.
Nachbur, Hermann; and Rohringer, Peter, to Ciba-Geigy Corporation. Process for manufacture of amidophosphates. 4,094,929, Cl. 260-968.000.
Nagasawa, Masahiro; Ishida, Tomio; and Yoshikawa, Yoshitaka, to Matsushita Electric Industrial Co., Ltd. Resin-bonded graphite body for a dry cell. 4,094,897, Cl. 264-105.000.
Nagumo, Shin-ichi: *See—*
Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Shin-ichi, 4,094,286, Cl. 123-119.00A.
Nagy, Ferenc, to Medicor Muvek. Circuit for defining the dye dilution curves in vivo and in vitro for calculating the cardiac blood flowrate value per minute. 4,095,117, Cl. 250-564.000.
Nahas, Nicholas C.: *See—*
Koh, Kwang K.; Nahas, Nicholas C.; Pennington, Robert E.; and Vernon, Lonnie W., 4,094,650, Cl. 48-197.00R.
Naito, Kenji, to Fuji Photo Film Co., Ltd. Process for producing finely divided porous polymer particles. 4,094,848, Cl. 260-29.60E.
Naka, Hiroshi: *See—*
Takano, Hiroshi; Yoshino, Masatsugu; Naka, Hiroshi; Ito, Yoshinobu; and Matsushika, Tadao, 4,094,676, Cl. 96-90.00R.
Nakagawa, Jihei, to Olympus Optical Co., Ltd. Large-aperture photographic lens system. 4,094,588, Cl. 350-215.000.
Nakagawa, Yohachiro; and Tanihata, Akio, to Bridgestone Tire Company Limited. Tire tube making apparatus. 4,094,728, Cl. 156-514.000.
Nakai, Setsuo; and Ochi, Hiroshi, to Sumitomo Chemical Company, Limited; and Japan Steel Works, Ltd., The. Method for removing unreacted monomer. 4,094,942, Cl. 264-102.000.
Nakajima, Yasuo: *See—*
Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Shin-ichi, 4,094,286, Cl. 123-119.00A.
Nakamura, Akihisa; Umemoto, Takashi; and Arai, Sakuji, to Honda Giken Kogyo Kabushiki Kaisha. Intake manifold for internal combustion engine. 4,094,276, Cl. 123-52.00M.
Nakamura, Zenzo, to Canon Kabushiki Kaisha. Electronic flash device. 4,095,141, Cl. 315-241.00P.
Nakamura, Zenzo: *See—*
Tsunekawa, Tokuichi; Uchidoi, Masanori; Nakamura, Zenzo; Taguchi, Tetsuya; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,095,242, Cl. 354-33.000.
Nakano, Teruyuki; and Otaka, Syoichi, to Honda Giken Kogyo Kabushiki Kaisha. Ignition timing control apparatus for engine during warm-up. 4,094,282, Cl. 123-117.00A.
Nakano, Yoshiaki, to Nippondenso Co., Ltd. Method for controlling information recognizing operation. 4,095,091, Cl. 235-462.000.
Nakano, Yoshiaki: *See—*
Okamoto, Atutoshi; Taniguchi, Koichi; Nakano, Yoshiaki; and Toyama, Koichi, 4,094,556, Cl. 303-109.000.
Nakase, Takamichi: *See—*
Hattori, Tadashi; and Nakase, Takamichi, 4,094,273, Cl. 123-32.0EE.
Nakayama, Yasuaki: *See—*
Tanai, Kunio; Nakayama, Yasuaki; Hirai, Yoshiro; Aoyama, Shigeru; and Kashima, Yoshinobu, 4,095,129, Cl. 310-49.00R.
Nangle, Bernard; McGaha, Patrick L.; Wallace, Thomas J.; and Anderson, Todd B., to Westinghouse Electric Corp. System for responding to a partial loss of load of a turbine power plant. 4,095,119, Cl. 290-40.00R.
Nanny, William C.: *See—*
Dickens, Luther I.; and Nanny, William C., 4,094,110, Cl. 52-80.000.
Narikiyo, Hiroyoshi: *See—*
Okuda, Hiroji; and Narikiyo, Hiroyoshi, 4,094,174, Cl. 72-238.000.
Narisawa, Shizuo: *See—*
Oyamada, Takeo; Satoh, Kazuhisa; Tsuru, Shinobu; Domoto, Masahiro; and Narisawa, Shizuo, 4,094,849, Cl. 260-29.6MQ.
Narita, Hiroshi, to Hitachi, Ltd. Regenerative brake control system for DC motor. 4,095,152, Cl. 318-376.000.
Nasson, Harold H. Ski binding adapter. 4,094,529, Cl. 280-614.000.
Nathanson, Eric. Adhesive bandage with reusable applique. 4,094,316, Cl. 128-156.000.
National Research Development Corporation: *See—*
Flain, Robert James; and Farley, Roy, 4,094,551, Cl. 302-26.000.
Gerzon, Michael Anthony, 4,095,049, Cl. 179-1.0GQ.
Power, Ronald Frederick; Barker, Alan Anthony; Martin, Michael Charles; and Grover, Brian Clifford, 4,095,057, Cl. 179-175.10A.
National Research Institute for Metals: *See—*
Tachikawa, Kyoji; and Itoh, Kikuo, 4,094,059, Cl. 29-599.000.
National Semiconductor Corporation: *See—*
Ochi, Sam S., 4,095,252, Cl. 357-43.000.
Naughton, Thomas J.: *See—*
Colchagoff, Robert D.; Fortner, Paul W.; Kirkman, Richard T.; Naughton, Thomas J.; and Zimmerman, George, 4,094,656, Cl. 65-81.000.
Naul, Frederick Henry, to TRW Valves Limited. Feed mechanism for use in a centerless grinding machine. 4,094,107, Cl. 51-215.0CP.
Nauroth, Peter: *See—*
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, 4,094,771, Cl. 209-4.000.
Navarre, Anatole Joseph, Jr., to Champion International Corporation. Stack gas analyzing system with calibrating/sampling feature. 4,094,187, Cl. 73-1.00G.
Naylor, Arthur G.: *See—*
Fegley, Charles R.; Morrow, Richard H.; and Naylor, Arthur G., 4,094,410, Cl. 209-73.000.
Naz, Paul. Self-compensating siding or roofing strip. 4,094,115, Cl. 52-521.000.
NCR Corporation: *See—*
Moschner, John L., 4,094,462, Cl. 235-419.000.
Neal, Donald Francis: *See—*
Hubbard, Roger Thomas John; Goosey, Richard Ernest; and Neal, Donald Francis, 4,094,708, Cl. 148-32.500.
Neff, Gregor N. Aquatic animal counting. 4,095,092, Cl. 235-92.0PK.
Nelham, Roy W.: *See—*
Holmes, Gordon W.; and Nelham, Roy W., 4,094,236, Cl. 99-450.400.
Nelson, Arthur R.: *See—*
McMahon, Donald H.; and Nelson, Arthur R., 4,094,579, Cl. 350-96.170.
Nelson, Bennie Charles, Jr., to Continental Group, Inc., The. Reusable, collapsible shipping container. 4,094,458, Cl. 229-39.00R.
Nelson, Hazen E., to Stone & Webster Engineering Corporation. Thermal storage with molten salt for peaking power. 4,094,148, Cl. 60-652.000.
Nelson Irrigation Corporation: *See—*
Meyer, Larry P., 4,094,467, Cl. 239-230.000.
Nelson, Jacob T. Dough dispensing and support apparatus. 4,094,623, Cl. 425-227.000.
Nelson, Sharon Parr, to Wilson Industries, Inc. Self-locking mule shoe. 4,094,360, Cl. 166-243.000.
Neotec Corporation: *See—*
Rosenthal, Robert D., 4,095,105, Cl. 250-338.000.
Neptume Microfloc, Inc.: *See—*
Booty, William Michael, 4,094,785, Cl. 210-70.000.
Nerem, Arne, to Rohr Industries, Incorporated. Transistor base drive regulator. 4,095,127, Cl. 307-253.000.
Nerf, Owe: *See—*
Danemar, Ake; Johansson, Arne; and Nerf, Owe, 4,095,264, Cl. 361-274.000.
Neri, Zeno: *See—*
Yeckley, Russell N.; and Neri, Zeno, 4,095,069, Cl. 200-148.00B.
Netzel, Philip C.; and Ponder, Jonathan Z., to Electric Power Research Institute. Multiple part insulator for flexible gas-insulated transmission line cable. 4,095,041, Cl. 174-28.000.
Neu, Gustav: *See—*
Blumenthal, Gunter; Neu, Gustav; and Bemmerl, Hans-Ferdinand, 4,094,155, Cl. 61-45.00D.
Neubauer, Gilbert A., to Monarch Marking Systems, Inc. Method of dispensing labels. 4,094,438, Cl. 221-1.000.

Neufeld, Ronald Murray: *See—*
Harris, Walter Jefferson; and Neufeld, Ronald Murray, 4,095,181, Cl. 324-238.000.

Neuman, Richard F., to Eaton Corporation. Bidirectional clearance sensing brake adjuster. 4,094,390, Cl. 188-196.00D.

Neveux, Rene, to Societe Anonyme Francaise du Ferodo. Liquid cooling apparatus. 4,094,358, Cl. 165-154.000.

New England Nuclear Corporation: *See—*
Layne, Warren W.; and Saklad, Eugene L., 4,094,965, Cl. 424-1.500.

Newberry, Robert Anthony, to John Wyeth & Brother Limited. 1,3-Diaryl-pyrazol-4-acrylic acid and derivatives. 4,095,025, Cl. 548-378.000.

Newkirk, David Dudley; Login, Robert Bernard; and Thir, Basil, to BASF Wyandotte Corporation. Oxidation stable fiber lubricant. 4,094,797, Cl. 252-8.900.

Newman, Robert. Fire proof cigarette box. 4,094,326, Cl. 131-234.000.

Newmont Exploration Limited: *See—*
Yannopoulos, John C.; and Borham, Borham M., 4,094,668, Cl. 75-99.000.

Newton, David W.; and Alford, Frank A., to Valleylab, Inc. Electrosurgical safety circuit and method of using same. 4,094,320, Cl. 128-303.140.

Ng, Wahling H.; and Zaycer, Andrew, to United States of America, Army. Self centering flange gasket assembly. 4,094,520, Cl. 277-166.000.

Nguyen-Tan Tai, Paul. Electronic power amplifier for delivering a constant power into a load impedance. 4,095,189, Cl. 330-265.000.

Nguyen, Van-Tran: *See—*
Damen, Theodoar Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, 4,095,122, Cl. 307-88.300.

Nickerson, Richard W.; and Nickerson, Thomas R. Quick-release, sure-set anti-fouling anchor. 4,094,264, Cl. 114-304.000.

Nickerson, Thomas R.: *See—*
Nickerson, Richard W.; and Nickerson, Thomas R., 4,094,264, Cl. 114-304.000.

Niem, Wolfgang: *See—*
Kleinschmidt, Johann Otto; and Niem, Wolfgang, 4,094,260, Cl. 112-121.150.

Niklas, Wilfrid F., to Varian Associates, Inc. Image tube employing a microchannel electron multiplier. 4,095,136, Cl. 315-11.000.

Nilsson, Olle: *See—*
Siwersson, Olle Lennart; Wall, Arne Evert; and Nilsson, Olle, 4,095,015, Cl. 429-15.000.

Ninomiya, Masakazu: *See—*
Harada, Susumu; and Ninomiya, Masakazu, 4,094,274, Cl. 123-32.0EL.

Nippon Carbon Co., Ltd.: *See—*
Ishikawa, Toshikatsu; Kanemaru, Toyonosuke; Teranishi, Haruo; and Onishi, Kazumasa, 4,094,951, Cl. 264-325.000.

Nippon Electric Co., Ltd.: *See—*
Kondo, Yojiro; and Ohta, Yoshinori, 4,094,583, Cl. 350-358.000.
Yoshida, Yasuharu, 4,095,187, Cl. 329-50.000.

Nippon Oil and Fats Co., Ltd.: *See—*
Fujiyama, Hikaru; Kasama, Tsuneo; and Higuchi, Shigenobu, 4,094,028, Cl. 9-321.000.

Nippon Shinyaku Co., Ltd.: *See—*
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,094,991, Cl. 424-309.000.

Nippon Soken, Inc.: *See—*
Hattori, Tadashi; and Nakase, Takamichi, 4,094,273, Cl. 123-32.0EE.

Nippon Telegraph and Telephone Public Corporation: *See—*
Gotoh, Kazuhiko; Kawashima, Hiroshi; and Katayama, Tsuyoshi, 4,095,055, Cl. 179-18.0GF.

Nippondenso Co., Ltd.: *See—*
Harada, Susumu; and Ninomiya, Masakazu, 4,094,274, Cl. 123-32.0EL.
Nakano, Yoshiaki, 4,095,091, Cl. 235-462.000.
Yamamoto, Akinori; and Kato, Masumi, 4,094,204, Cl. 74-230.17E.

Nippondenso Kabushiki Kaisha: *See—*
Okamoto, Atutoshi; Taniguchi, Koichi; Nakano, Yoshiaki; and Toyama, Koichi, 4,094,556, Cl. 303-109.000.

Nishikawa, Hideichi; and Sakamoto, Masaharu, to Matsuzaka Iron Works, Inc. Shearing tool for synthetic resin tubes. 4,094,064, Cl. 30-92.000.

Nishikawa, Mitsuo; Hosaka, Hideo; and Maemori, Jun, to Max Co., Ltd. Automatic binder. 4,094,342, Cl. 140-93.200.

Nishikubo, Yasuhiko: *See—*
Nomura, Yasushi; and Nishikubo, Yasuhiko, 4,094,139, Cl. 58-50.00R.

Nishioka, Matsuo; and Oka, Shunzo, to Matsushita Electric Industrial Co., Ltd. Interlocked push-lock push-button switch assembly having conductive muting spring. 4,095,059, Cl. 200-5.00B.

Nishiwaki, Osamu: *See—*
Tanaka, Kunihiko; Kurita, Masaru; and Nishiwaki, Osamu, 4,094,872, Cl. 544-26.000.

Nissan Motor Company, Ltd.: *See—*
Kishida, Katsuhiro; and Oyamada, Akira, 4,095,005, Cl. 427-376.00B.
Kuroda, Hiroshi; Nakajima, Yasuo; Hayashi, Yoshimasa; and Nagumo, Shin-ichi, 4,094,286, Cl. 123-119.00A.

Nitta, Tohei: *See—*
Miyamoto, Teruo; Ishii, Toshiji; Miura, Yoshikazu; and Nitta, Tohei, 4,095,204, Cl. 336-57.000.

Nixon, John M., to Edo-Aire Mitchell. Aircraft altitude hold system. 4,094,480, Cl. 244-180.000.

Nixon, Phillip Sydney; and Woods, Harold, to Triplex Safety Glass Company Limited. Processing of glass sheets. 4,094,659, Cl. 65-104.000.

Nobuhara, Akio: *See—*
Aishima, Tetsuo; and Nobuhara, Akio, 4,094,997, Cl. 426-533.000.

Noguchi, Kosaku; Yoshimura, Kiyoharu; Tanaka, Honami; and Hayashi, Masao, to Koa Oil Co., Ltd. Method for treatment of oil-containing waste water by using an oil adsorbent. 4,094,776, Cl. 210-27.000.

Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system. 4,094,287, Cl. 123-119.00A.

Nolan, Ronald M., Jr. Picture frame apparatus. 4,094,085, Cl. 40-152.100.

Nomura, Yasushi; and Morokawa, Shigeru, to Citizen Watch Company Limited. Switch control unit for electronic timepiece. 4,094,135, Cl. 58-23.00R.

Nomura, Yasushi; and Nishikubo, Yasuhiko, to Citizen Watch Company Limited. Display control circuit for electronic timepiece. 4,094,139, Cl. 58-50.00R.

Nordin, Bengt Anders. Device for unloading of timber. 4,094,421, Cl. 214-82.000.

North American Philips Corporation: *See—*
Ragan, Randall C., 4,095,210, Cl. 338-180.000.

Northrop Corporation: *See—*
Mackey, Jack D., 4,094,750, Cl. 204-56.00R.

Northwestern University: *See—*
Cohen, Jerome B.; and James, Michael R., 4,095,103, Cl. 250-277.0CH.

Notter, Michael A. Motorized skateboard with uni-directional rear mounting. 4,094,372, Cl. 180-1.00G.

Novanex Automation N.V.: *See—*
Laupman, Robert Ronald, 4,095,188, Cl. 330-84.000.

Nozik, Arthur J., to Allied Chemical Corporation. Photochemical diodes. 4,094,751, Cl. 204-80.000.

Numata, Saburo; and Fujino, Shin-ichiro, to Fuji Photo Optical Co., Ltd. Warning device for a camera. 4,095,243, Cl. 354-60.00L.

Numbers, Jody L., to Thermo-Seal, Inc. Drinking receptacle valve means. 4,094,433, Cl. 220-90.400.

Nunnery, William Burrell: *See—*
Hoffman, Charles Reeves; and Nunnery, William Burrell, 4,095,126, Cl. 307-237.000.

Nystad, Jan. Water mattress. 4,094,025, Cl. 5-365.000.

O and K Orenstein & Koppel Aktiengesellschaft: *See—*
Kruger, Rolf, 4,094,419, Cl. 214-10.000.

O'Callaghan, James S., to Tram/Diamond Corporation. Radio mounting bracket. 4,094,485, Cl. 248-221.300.

Ochi, Hiroshi: *See—*
Nakai, Setsuo; and Ochi, Hiroshi, 4,094,942, Cl. 264-102.000.

Ochi, Sam S., to National Semiconductor Corporation. Composite JFET-bipolar transistor structure. 4,095,252, Cl. 357-43.000.

O'Connell, Donald E.: *See—*
Cohen, Murray S.; and O'Connell, Donald E., 4,094,999, Cl. 426-547.000.

O'Dea, Orrin Bernard, to Communication Mfg. Company. Telephone switching system test set. 4,095,058, Cl. 179-175.20D.

Odeyemi, Oluwasuyi: *See—*
Alexander, Martin; and Odeyemi, Oluwasuyi, 4,094,097, Cl. 47-57.600.

Oehler, Harry G., to Westinghouse Electric Corp. Memory including varactor circuit to boost address signals. 4,095,282, Cl. 365-204.000.

Oellig, Rudi: *See—*
Jellinek, Karl; and Oellig, Rudi, 4,094,925, Cl. 260-836.000.

O'Farrell, John J., Jr. Transformer/switch device. 4,095,124, Cl. 307-141.400.

Ogawa, Akira: *See—*
Tsujino, Nobuyuki; Ogawa, Akira; Shishido, Tadao; and Adachi, Keiichi, 4,094,683, Cl. 96-95.000.

Ohata, Katsuya: *See—*
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,094,991, Cl. 424-309.000.

Ohnmacht, Helmut; and Brechner, Ernst, to Fritz Eichenauer, Firma. Vaporizing and warming device for beverage-preparing machines. 4,095,086, Cl. 219-283.000.

Ohnuma, Sadabumi: *See—*
Fujii, Yoshio; Shimada, Mitsuo; and Ohnuma, Sadabumi, 4,094,609, Cl. 356-201.000.

Ohta, Yoshinori: *See—*
Kondo, Yojiro; and Ohta, Yoshinori, 4,094,583, Cl. 350-358.000.

Ohue, Hideki; and Katayama, Masatoshi. Timepiece-gas lighter assembly. 4,094,140, Cl. 58-152.00R.

Oka, Shunzo: *See—*
Nishioka, Matsuo; and Oka, Shunzo, 4,095,059, Cl. 200-5.00B.

Okabe, Masayoshi: *See—*
Iwai, Yasuto; Okabe, Masayoshi; Seki, Naotoshi; Hiai, Atsuhiko; and Iguchi, Seiya, 4,094,780, Cl. 210-38.00B.

Okamoto, Atutoshi; Taniguchi, Koichi; Nakano, Yoshiaki; and Toyama, Koichi, to Nippondenso Kabushiki Kaisha. Anti-skid system for a vehicle. 4,094,556, Cl. 303-109.000.

Okamoto, Tadao: *See—*
Komamura, Takeo; Okamoto, Tadao; and Ishihama, Atsumi, 4,094,313, Cl. 128-130.000.

Okita, Taisuke: *See—*
Harada, Taro; Okita, Taisuke; Hara, Takahisa; and Ikezawa, Yuji, 4,094,854, Cl. 260-42.460.

Okuda, Hiroji; and Narikiyo, Hiroyoshi, to Koyo Seiko Company Limited. Drive mechanism for vertical rolling mills. 4,094,174, Cl. 72-238.000.

Okuda, Hiroji, to Koyo Seiko Company Limited. Driving device for high speed rolling mills and the like. 4,094,179, Cl. 72-238.000.

Okumura, Koji, to Xerox Corporation. Electrical information storage system using a layer of particulate photosensitive material. 4,095,280, Cl. 365-112.000.

Oldham, Frederick, to Clark, Robert Tilden. Method and apparatus for forming a sole on an upper by dip-coating. 4,094,950, Cl. 264-259.000.

Olin Corporation: *See—*
Chandalia, Kiran B.; and Preston, Frank J., 4,094,868, Cl. 260-192.000.

Olinkraft, Inc.: *See—*
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,094,455, Cl. 229-15.000.
Coons, Everett A., 4,094,459, Cl. 229-41.00B.

Olney, Wallace E.; and Wright, Robert G., to Brown Company. Filter paper cup for a percolator and process for making the same. 4,094,234, Cl. 99-310.000.

Olson, Cecil G.: *See—*
Edwards, Richard A.; and Olson, Cecil G., 4,094,244, Cl. 101-66.000.

Olson, Robert K.; and Smith, Lester F., to UOP Inc. Regeneration method for gravity-flowing deactivated catalyst particles. 4,094,817, Cl. 252-415.000.

Olson, Robert K.: *See—*
Lemberger, Earl S.; Olson, Robert K.; and Smith, Lester F., 4,094,814, Cl. 252-415.000.

Olympus Optical Co., Ltd.: *See—*
Nakagawa, Jihei, 4,094,588, Cl. 350-215.000.
Takahashi, Naoyuki, 4,095,123, Cl. 307-115.000.

Omoda, Kouichiro: *See—*
Kawabe, Shun; and Omoda, Kouichiro, 4,095,269, Cl. 364-200.000.

Omori, Eiji; Aimono, Yuuji; Mukoyama, Yoshiyuki; and Sugitani, Hatuo, to Hitachi Chemical Company, Ltd. Unsaturated polyester resinous composition. 4,094,835, Cl. 260-22.0CB.

Omron Tateisi Electronics Co.: *See—*
Yasutake, Akira; and Kiso, Shigemitsu, 4,094,058, Cl. 29-592.00R.

Onda, Yuzi: *See—*
Mizuno, Kinichi; Saito, Masao; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, 4,094,905, Cl. 260-561.00R.

Onder, Besir K., to Upjohn Company, The. Preparation of polyamideimide from diisocyanate with alkali metal lactamate catalyst. 4,094,864, Cl. 260-78.0TF.

Onder, Besir K., to Upjohn Company, The. Preparation of polyamide from diisocyanate with alkali metal lactamate catalyst. 4,094,866, Cl. 260-78.00R.

Onishi, Kazumasa: *See—*
Ishikawa, Toshikatsu; Kanemaru, Toyonosuke; Teranishi, Haruo; and Onishi, Kazumasa, 4,094,951, Cl. 264-325.000.

Ono, Tasuku, to Stiron Chemical Industry Co. Ltd. Sound making movable toy. 4,094,094, Cl. 46-232.000.

Opcon Associates of Canada, Ltd.: *See—*
Betensky, Ellis I., 4,094,585, Cl. 350-175.00E.

Orr, F. D., Jr.; Templeton, L. F.; and Keutzer, Larry L., to Accelerators, Inc. Ozone generation apparatus and method. 4,095,115, Cl. 250-538.000.

Osaka Denki Co., Ltd.: *See—*
Ueyama, Fumio; and Yoshimitsu, Takao, 4,095,080, Cl. 219-74.000.

Oshima, Kenji; Matsumoto, Tomohisa; Yamazaki, Hiroshi; and Yoshioka, Tamotsu, to Kabushiki Kaisha Seikosha. Synchronous motor. 4,095,130, Cl. 310-162.000.

Osterried, Gordon A. Briquette igniting device with foraminous metal cone. 4,094,649, Cl. 44-35.000.

Oswald, Alexis A.: *See—*
Zapp, Robert L.; and Oswald, Alexis A., 4,094,757, Cl. 204-159.180.

Oswald, Robert Clement, to Sperry Rand Corporation. Digital convergence system for a multi-gun CRT. 4,095,137, Cl. 315-13.00C.

Otaka, Syoichi: *See—*
Nakano, Teruyuki; and Otaka, Syoichi, 4,094,282, Cl. 123-117.00A.

Ototani, Tohei, to Metal Research Corporation. Method for refining molten iron and steels. 4,094,666, Cl. 75-58.000.

Otsuki, Keizo: *See—*
Yoshimura, Masayoshi; Otsuki, Keizo; Shoji, Senji; Yamada, Tomio; Shimizu, Ichio; and Arai, Yuji, 4,095,253, Cl. 357-81.000.

Owens-Corning Fiberglas Corporation: *See—*
Paetz, Frederic Harold, 4,094,944, Cl. 264-137.000.
Zellar, Wade V.; and Strauss, Carl R., 4,095,010, Cl. 428-375.000.

Owens-Illinois, Inc.: *See—*
Colchagoff, Robert D.; Fortner, Paul W.; Kirkman, Richard T.; Naughton, Thomas J.; and Zimmerman, George, 4,094,656, Cl. 65-81.000.
Taylor, Lynn J., 4,094,756, Cl. 204-159.180.

Oxy Metal Industries Corporation: *See—*
Fekete, Douglas D., 4,094,701, Cl. 134-2.000.

Oy Vehna AB: *See—*
Rennes, Harri; and Lippuner, Christian, 4,094,700, Cl. 127-24.000.

Oyama, Yoshishige; Teranishi, Takao; and Yamauchi, Teruo, to Hitachi, Ltd. Gas mixture feed system for internal combustion engine. 4,094,285, Cl. 123-119.00A.

Oyamada, Akira: *See—*
Kishida, Katsuhiro; and Oyamada, Akira, 4,095,005, Cl. 427-376.00B.

Oyamada, Takeo; Satoh, Kazuhisa; Tsuru, Shinobu; Domoto, Masahiro; and Narisawa, Shizuo, to Sumitomo Chemical Company, Limited. Process for producing aqueous dispersion of ethylene-vinyl acetate copolymer containing no formalin. 4,094,849, Cl. 260-29.6MQ.

Ozaki, Takayuki: *See—*
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,094,991, Cl. 424-309.000.

Pace, Casey C.: *See—*
Dismuke, William Odell, 4,094,290, Cl. 123-141.000.

Pace, Courtney C.: *See—*
Dismuke, William Odell, 4,094,290, Cl. 123-141.000.

Pacific Electricord Company: *See—*
Dietz, Ernest W., 4,094,569, Cl. 339-40.000.

Paetz, Frederic Harold, to Owens-Corning Fiberglas Corporation. Machine for and continuous process of making molded tile. 4,094,944, Cl. 264-137.000.

Paget, Fredrick W., to GTE Sylvania Incorporated. Arc discharge lamp ballast tester. 4,095,175, Cl. 324-57.00R.

Palac, Kazimir, to Zenith Radio Corporation. Method of making curved color cathode ray tube shadow masks having interregistrable electron beam-passing aperture patterns. 4,094,678, Cl. 96-36.100.

Palmer, Richard C.: *See—*
Fleck, James N.; Palmer, Richard C.; and Ruffner, Charles L., 4,094,672, Cl. 75-226.000.

Palosi, Eva: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,094,908, Cl. 260-570.00R.

Pang, Sing-Chin: *See—*
Genna, Sebastian; and Pang, Sing-Chin, 4,095,107, Cl. 250-363.00S.

Panzera, Carlino: *See—*
Erickson, Arnold Roderick; and Panzera, Carlino, 4,094,673, Cl. 75-246.000.

Papa, Roberto: *See—*
Carubia, Giovanni; Papa, Roberto; and Pratelli, Cesare, 4,095,266, Cl. 364-200.000.

Papanikolaou, Sotirios. Illuminated razor. 4,094,062, Cl. 30-34.00R.

Parker, Ian David: *See—*
Ells, John William; Parker, Ian David; and Walker, David Baird Langley, 4,094,163, Cl. 61-111.000.

Parker, Louis W. Direct current motors. 4,095,148, Cl. 318-138.000.

Parlante, Frank; and Parlante, Henry, to Courtlandt Boot Jack Co., Ltd. Open-top holster for revolver. 4,094,450, Cl. 224-2.00B.

Parlante, Henry: *See—*
Parlante, Frank; and Parlante, Henry, 4,094,450, Cl. 224-2.00B.

Parra, Gilbert T., to United States of America, National Aeronautics and Space Administration. Angle detector. 4,094,073, Cl. 33-366.000.

Parrier, Andre; Parrier, Jean; and Parrier, Henri. Safety electric connector. 4,094,565, Cl. 339-14.00P.

Parrier, Henri: *See—*
Parrier, Andre; Parrier, Jean; and Parrier, Henri, 4,094,565, Cl. 339-14.00P.

Parrier, Jean: *See—*
Parrier, Andre; Parrier, Jean; and Parrier, Henri, 4,094,565, Cl. 339-14.00P.

Partenheimer, Walter, to Standard Oil Company. Method for stabilizing a phosphorus-vanadium-oxygen complex catalyst. 4,094,816, Cl. 252-415.000.

Patel, Chandra Kumar Naranbhai: *See—*
Damen, Theodoar Charlouis; Gornik, Erich; Nguyen, Van-Tran; and Patel, Chandra Kumar Naranbhai, 4,095,122, Cl. 307-88.300.

Pater, Hendrik; Torgersen, G. Earl; and Brunner, Fritz R., to Pater, Hendrik. Self-controlled on-grade monorail track switch and method. 4,094,252, Cl. 104-130.000.

Patzig, Dieter, to Ludwig Taprogge Reinigungsanlagen fur Rohren-Warmeaustauscher. Filter apparatus, especially for a liquid to be fed to a power-plant condenser. 4,094,793, Cl. 210-323.00R.

Pausmer, Philip W.: *See—*
Johnson, William A.; Pausmer, Philip W.; and Harmon, Russel J., 4,094,532, Cl. 280-695.000.

Payrhammer, Bernd; and Treiber, Helmut, to Agfa-Gevaert Aktiengesellschaft. Apparatus for determining the light transmissivity of film frames or the like. 4,094,604, Cl. 355-68.000.

PCB Controls Ltd.: *See—*
Byrne, Peter Cyril; and Moore, Desmond F., 4,094,555, Cl. 303-100.000.

Pechner, Julius. Internal tumbler lock key change system. 4,094,175, Cl. 70-364.00A.

Peisker, Glenn W.: *See—*
Heyn, William O.; and Peisker, Glenn W., 4,094,519, Cl. 277-134.000.

Pelat, Roger Patrice; and Le Pierres, Gildas, to International Vibration Engineering. Inertia dependent device for preventing and permitting relative rotation between two members. 4,094,387, Cl. 188-1.00B.

Pennington, Robert E.: *See—*
Koh, Kwang K.; Nahas, Nicholas C.; Pennington, Robert E.; and Vernon, Lonnie W., 4,094,650, Cl. 48-197.00R.

Pennsylvania Engineering Corporation: *See—*
Readal, John P., 4,094,496, Cl. 266-142.000.

PepsiCo, Inc.: *See—*
Clarke, Richard Allen; Chvala, William James; and DeWitte, Raymond Edward, 4,094,526, Cl. 280-47.350.

Perron, Peter James: *See—*
Carrock, Frederick Elias; Perron, Peter James; and Zukowski, Edward August, 4,095,016, Cl. 526-137.000.

Perry Oceanographics, Inc.: *See—*
Hettinger, Frederic L., 4,094,159, Cl. 61-69.00R.

Peters, Albert: *See—*
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, 4,094,771, Cl. 209-4.000.

Peterson, Don G.; and Harper, Judson M., to Food Processes, Inc. Granular bed roaster construction. 4,094,633, Cl. 432-118.000.

Petro-Data C. A.: *See—*
King, David W., 4,094,359, Cl. 166-65.00R.

Petursson, Sigurdur G. Regulating valve system. 4,094,333, Cl. 137-100.000.

Petzold, Manfred: *See—*
Heyden, Rudi; Asbeck, Adolf; Eckelt, Michael; Petzold, Manfred; and Uphues, Gunter, 4,094,812, Cl. 252-321.000.

Pfefferle, William C., to Engelhard Minerals & Chemicals Corp. Turbine system method and apparatus. 4,094,142, Cl. 60-39.030.

Pfenninger, Hans, to BBC Brown, Boveri & Company Limited. Thermal power station combined with a plant for seawater desalination. 4,094,747, Cl. 202-173.000.

Pfizer Inc.: *See—*
Hess, Hans-Jurgen E., 4,094,899, Cl. 260-514.00D.

Pharmacia Fine Chemicals AB: *See—*
Johansson, Haldor Ingemar; Lindstrom, Dag Torsten; and Soderberg, John Lennart, 4,094,833, Cl. 260-17.4GC.
Soderberg, John Lennart, 4,094,832, Cl. 260-17.4GC.

Phillips Petroleum Company: *See—*
Ball, Donald H.; Rutledge, Robert W.; and Voelkers, James D., 4,094,959, Cl. 423-359.000.
Bertus, Brent J., 4,094,819, Cl. 252-435.000.
Dixon, Rolland E., 4,094,923, Cl. 260-683.480.
Gifford, Phillip H., II, 4,094,767, Cl. 208-11.00R.
Hsieh, Henry L., 4,095,017, Cl. 526-188.000.
Janzen, G. Jay, 4,095,272, Cl. 364-497.000.
Murtha, Timothy P.; and Zuech, Ernest A., 4,094,918, Cl. 260-668.00R.
Murtha, Timothy P.; and Zuech, Ernest A., 4,094,920, Cl. 260-668.00R.
Stapp, Paul R., 4,095,030, Cl. 560-100.000.
Stapp, Paul R., 4,095,037, Cl. 560-246.000.
Vanderveen, John W., 4,094,960, Cl. 423-456.000.

Photon Power, Inc.: *See—*
Jordan, John Francis; and Lampkin, Curtis Magill, 4,095,006, Cl. 427-427. .00.

Pianezza, Anthony. Electrically-heated container. 4,095,090, Cl. 219-441.000.

Piber, Earl T., to Cutler-Hammer, Inc. Industrial speed control trigger switch with integral reversing switch. 4,095,072, Cl. 200-157.000.

Pichon, Georges. Connection for evacuation pipes. 4,094,538, Cl. 285-150.000.

Piotrowski, Charles, to Sheffer Collet Company. Collet chuck. 4,094,521, Cl. 279-4.000.

Pirogov, Vyacheslav Dmitrievich: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

Pitis, Ion: *See—*
Moraru, Dinu Stefan; Pitis, Ion; and Bogos, Constantin, 4,094,691, Cl. 106-95.000.

Plastiroute S.A.: *See—*
Dubois, Robert, 4,094,686, Cl. 106-13.000.

Plastofilm Industries, Inc.: *See—*
Seeley, Leonard, 4,094,648, Cl. 23-259.000.

Platt Saco Lowell Limited: *See—*
Savageau, Richard J., 4,095,062, Cl. 200-61.130.

Plegat, Alain Edouard, to Societe Anonyme des Usines Chausson. Machine for forming joining pipes. 4,094,184, Cl. 72-392.000.

Plumer, Werner: *See—*
Fabian, Wolfgang; Plumer, Werner; Sevenich, Theodor; and Zehnter, Heribert, 4,094,219, Cl. 83-345.000.

Poff, Jerry W.: *See—*
Poff, Joseph F.; and Poff, Jerry W., 4,094,332, Cl. 137-46.000.

Poff, Joseph F.; and Poff, Jerry W. Earthquake-responsive fuel shut-off device. 4,094,332, Cl. 137-46.000.

Polak's Frutal Works, Inc.: *See—*
Engle, Edward Jacob, 4,095,031, Cl. 526-1.000.

Polen, Karl L., to Alliance Machine Company, The. Gantry cranes. 4,094,493, Cl. 254-144.000.

Poletto, John Frank: *See—*
Bernady, Karel Francis; Poletto, John Frank; and Weiss, Martin Joseph, 4,094,896, Cl. 260-456.00A.

Polton, Alain: *See—*
Baudin, Cecile; Miskovic, Mihajlo; Polton, Alain; and Sigwalt, Pierre, 4,094,830, Cl. 260-4.00R.

Polymer Corporation, The: *See—*
Gage, Paul E., 4,094,253, Cl. 105-225.000.

Polymerics, Inc.: *See—*
Lester, David; and Alexander, Robert R., 4,094,685, Cl. 260-2.50B.

Ponder, Jonathan Z.: *See—*
Netzel, Philip C.; and Ponder, Jonathan Z., 4,095,041, Cl. 174-28.000.

Porcelli, V. Lorenzo: *See—*
Miller, Paul D.; and Porcelli, V. Lorenzo, 4,094,404, Cl. 206-45.150.

Power, Ronald Frederick; Barker, Alan Anthony; Martin, Michael Charles; and Grover, Brian Clifford, to National Research Development Corporation. Frequency response testing apparatus. 4,095,057, Cl. 179-175.10A.

Pozhivanov, Alexandr Mikhailovich: *See—*
Kolpakov, Serafim Vasilievich; Gurkov, Zinovy Lvovich; Bondarenko, Oleg Leonidovich; Valtsov, Vladimir Viktorovich; Pozhivanov, Alexandr Mikhailovich; Gugnin, Eduard Dmitrievich; Radilov, Stanislav Vyacheslavovich; and Bogdanov, Alexandr Andreevich, 4,094,938, Cl. 264-30.000.

PPG Industries, Inc.: *See—*
Gillery, Frank H.; Pressau, Jean P.; and Kubichan, Robert E., 4,094,763, Cl. 204-192.00P.
Stewart, Dorothy A.; Ricketts, Bobby D.; and Hoelscher, Charles H., 4,094,808, Cl. 252-186.000.

PQ Corporation: *See—*
Lazet, Frank J., 4,094,658, Cl. 65-90.000.

Pratelli, Cesare: *See—*
Carubia, Giovanni; Papa, Roberto; and Pratelli, Cesare, 4,095,266, Cl. 364-200.000.

Precision Fabricators, Inc.: *See—*
Hamner, George F.; and Hamner, Richard M., 4,094,168, Cl. 62-347.000.

Preissinger, Karl-Heinz: *See—*
Behn, Reinhard; Loebl, Harald; and Preissinger, Karl-Heinz, 4,095,199, Cl. 333-70.00R.

Press- & Stanzwerk AG: *See—*
Mettler, Karl, 4,094,183, Cl. 72-356.000.

Pressau, Jean P.: *See—*
Gillery, Frank H.; Pressau, Jean P.; and Kubichan, Robert E., 4,094,763, Cl. 204-192.00P.

Prest, William M., Jr.; and Luca, David J., to Xerox Corporation. Process for controlled phase transformation of alpha phase of poly(-vinylidene fluoride) to the gamma phase. 4,095,020, Cl. 528-494.000.

Preston, Frank J.: *See—*
Chandalia, Kiran B.; and Preston, Frank J., 4,094,868, Cl. 260-192.000.

Pridmore, Lawrence W., to GTE Sylvania Incorporated. Electron beam crossover correction circuitry. 4,095,143, Cl. 315-370.000.

Prinzing, Robert, to Gema AG Apparatebau. Cabin for an electrostatic powder coating installation. 4,094,654, Cl. 55-290.000.

Procor Limited: *See—*
Wang, William Hsien-Kuang, 4,094,185, Cl. 72-477.000.

Procter & Gamble Company, The: *See—*
Wiers, Brandon Helmholz, 4,094,806, Cl. 252-102.000.

Procter & Schwartz, Inc.: *See—*
George, K. A., 4,094,399, Cl. 198-535.000.

Protano, Dominic R.; and Conte, Ronald L. Apparatus for the removal of water from a swimming pool duct. 4,094,022, Cl. 4-172.170.

Prouvost, Francois. Construction of houses or similar buildings by means of an inflatable structure. 4,094,109, Cl. 52-2.000.

Pruitt, Billy Paul. Remote electric state tester. 4,095,212, Cl. 340-224.000.

Pryor, Harold A.: *See—*
Pryor, Roy R.; and Pryor, Harold A., 4,094,220, Cl. 83-712.000.

Pryor, Roy R.; and Pryor, Harold A. Sawmill method and apparatus. 4,094,220, Cl. 83-712.000.

Pullman Incorporated: *See—*
Glassmeyer, John J.; and Kelley, Joseph T., 4,094,546, Cl. 296-28.00M.

Purrmann, Robert: *See—*
Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, 4,095,018, Cl. 526-211.000.

Putter, Rolf: *See—*
Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, 4,094,852, Cl. 260-37.00N.
Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, 4,094,861, Cl. 260-47.00P.

Quaker Oats Company, The: *See—*
Greenberg, Michael J., 4,094,998, Cl. 426-535.000.

Quarton, William T.; and Lowe, Peter R., to Honeywell Inc. Recording apparatus. 4,095,235, Cl. 346-110.00R.

Queen, William E.: *See—*
Atkinson, Edward E.; and Queen, William E., 4,095,192, Cl. 331-78.000.

Queneau, Paul B.: *See—*
Symens, Raymond D.; Queneau, Paul B.; Chou, Eddie C. J.; and Clark, Franklin F., 4,094,754, Cl. 204-108.000.

R B Toy Development Co.: *See—*
Kupperman, Sam; and Kupperman, Dennis, 4,094,091, Cl. 46-53.000.

R. G. Dixon & Company Limited: *See—*
Wilkins, John Thomas; and Mayo, Haydn Frank, 4,094,034, Cl. 15-49.00R.

R. Nelham & Associates Incorporated: *See—*
Holmes, Gordon W.; and Nelham, Roy W., 4,094,236, Cl. 99-450.400.

Rabuffetti, Sergio, to U.S. Philips Corporation. Method and apparatus for controlling by-pass liquid flow in dish-washing machines. 4,094,702, Cl. 134-10.000.

Raccaforte, Harry I., to Champion International Corporation. Reclosable dispensing carton. 4,094,456, Cl. 229-17.0SC.

Radek, John R., to Ready Metal Manufacturing Company. Napkin dispenser. 4,094,442, Cl. 221-59.000.

Radilov, Stanislav Vyacheslavovich: *See—*
Kolpakov, Serafim Vasilievich; Gurkov, Zinovy Lvovich; Bondarenko, Oleg Leonidovich; Valtsov, Vladimir Viktorovich; Pozhivanov, Alexandr Mikhailovich; Gugnin, Eduard Dmitrievich; Radilov, Stanislav Vyacheslavovich; and Bogdanov, Alexandr Andreevich, 4,094,938, Cl. 264-30.000.

Radva Plastics Corporation: *See—*
Dickens, Luther I.; and Nanny, William C., 4,094,110, Cl. 52-80.000.

Ragan, Randall C., to North American Philips Corporation. Helical coil spring wiper potentiometer contact device. 4,095,210, Cl. 338-180.000.

Rahilly, W. Patrick, to United States of America, Air Force. Method for fabrication of high minority carrier lifetime, low to moderate resistivity, single crystal silicon. 4,094,730, Cl. 156-606.000.

Railweight, Inc.: *See—*
Jones, William F.; and Hochberger, Gerald J., 4,094,367, Cl. 177-1.000.

Ralph M. Parsons Company: *See—*
Beavon, David K., 4,094,961, Cl. 423-564.000.

Ramnarace, Jawaharlal, to Ford Aerospace & Communications Corporation. Tracer and composition. 4,094,711, Cl. 149-4.000.

Randina, Larisa Vasilievna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

Rao, Rao K.: *See—*
Reinberg, Alan R.; and Rao, Rao K., 4,094,732, Cl. 156-643.000.

Rapp, Robert A. Swimming pool cover. 4,094,021, Cl. 4-172.120.

Rasmussen, Poul; and Kartman, Helge C. C., to F. L. Smith & Co. Rotary drum. 4,094,628, Cl. 432-80.000.

Rasp, Christian: *See—*
Botta, Artur; von Konig, Anita; Moll, Franz; Rasp, Christian; and Hartl, Johannes, 4,094,811, Cl. 252-313.00R.

Ratchford, Debrilla M. Suitcase with wheels and transporting hook. 4,094,391, Cl. 190-18.00A.

Rathbun, Kenneth R. Solar-MHD energy conversion system. 4,095,118, Cl. 290-2.000.

Rauma-Repola Oy: *See—*
Makela, Markku, 4,094,452, Cl. 226-34.000.

Rauschenfels, Eberhard, to Dyckerhoff Zementwerke Aktiengesellschaft. Process for stabilizing cement stone formed with aluminous binders. 4,094,692, Cl. 106-104.000.

Ray, Gerald E. Dental floss manipulating instrument. 4,094,328, Cl. 132-91.000.

Raychem Corporation: *See—*
Horsma, David August; and De Blauwe, Francis, 4,095,044, Cl. 174-138.00F.

Rayeski, Thomas J.: *See—*
Carmi, Arieh; Chang, Zung S.; and Rayeski, Thomas J., 4,094,657, Cl. 65-83.000.

Raymond Engineering Inc.: *See—*
Spaman, Donald R.; and Schilke, David C., 4,095,146, Cl. 318-7.000.

Raymond Lee Organization, Inc., The: *See—*
Barron, William F., 4,094,509, Cl. 273-247.000.
Gonzalez, James, 4,095,273, Cl. 364-705.000.
McMillan, Ronald J., 4,094,639, Cl. 21-74.00R.

RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 4,095,164, Cl. 323-8.000.
Brooks, Ronald Robert; and Wojslawowicz, Jack Edward, 4,095,155, Cl. 318-541.000.
Denes, George, 4,095,281, Cl. 365-156.000.
Goodman, Lawrence Alan, 4,094,582, Cl. 350-333.000.
Groeneweg, Willem Hendrik; Tuma, Alois Vaclav; and Harwood, Leopold Albert, 4,095,255, Cl. 358-17.000.
Hannan, William James, 4,094,584, Cl. 350-162.0SF.
Hawrylo, Frank Zygmunt; and Kressel, Henry, 4,095,011, Cl. 428-469.000.

Readal, John P., to Pennsylvania Engineering Corporation. Enclosure for steel converting apparatus. 4,094,496, Cl. 266-142.000.

Reader, Grant W.: *See—*
Rokach, Joshua; and Reader, Grant W., 4,094,986, Cl. 424-270.000.

Ready Metal Manufacturing Company: *See—*
Radek, John R., 4,094,442, Cl. 221-59.000.

Redden, Robert F.: *See—*
Charlton, Thomas L.; and Redden, Robert F., 4,094,753, Cl. 204-105.00R.

Reed, Robert D.; and Street, Vern A., to John Zink Company. Accelerated response for delivery of smoke suppressant to flares. 4,094,632, Cl. 431-202.000.

Reed, William H.: *See—*
Bauerle, James E.; Reed, William H.; and Berkey, Edgar, 4,095,171, Cl. 324-33.000.

Reeve, Gerome R., to Titus, Gerald F. Pulsed light signal receiver. 4,095,097, Cl. 250-199.000.

Refeka Werbemittel GmbH: *See—*
Ruger, Walther, 4,094,405, Cl. 206-423.000.

Rehbein, Friedhelm, to Thiele, August. Terminal chain link with built-in indicator. 4,094,141, Cl. 59-93.000.

Rehn, Heinz, to Rollei-Werke Franke & Heidecke. Interchangeable objective for cameras. 4,095,247, Cl. 354-286.000.

Reimert, Larry E., to Vetco, Inc. Rigid connector and piling. 4,094,539, Cl. 285-309.000.

Reinberg, Alan R.; and Rao, Rao K., to Texas Instruments Incorporated. Silicon etching process. 4,094,732, Cl. 156-643.000.

Reiner, Joseph; Vigluicci, Kenneth; and Reiner, Michael. Beach sandal. 4,094,081, Cl. 36-116.000.

Reiner, Michael: *See—*
Reiner, Joseph; Vigluicci, Kenneth; and Reiner, Michael, 4,094,081, Cl. 36-116.000.

Reinhardt, Helmut: *See—*
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, 4,094,771, Cl. 209-4.000.

Reinhardt, Johann: *See—*
Hadi, Ali Sameh Abdel; Reinhardt, Johann; and Knapp, Jutta, 4,094,953, Cl. 423-2.000.

Reinhart, Jay J.: *See—*
Wolff, Douglas F.; Minick, Harold N.; and Reinhart, Jay J., 4,094,561, Cl. 312-223.000.

Reitel, Christian: *See—*
Mangold, Dietrich; Koenig, Karl-Heinz; and Reitel, Christian, 4,095,034, Cl. 560-134.000.

Rennes, Harri; and Lippuner, Christian, to Gebrueder Buehler AG; and Oy Vehna AB, part interest to each. Apparatus and process for the production of gluten and starch from wheat, rye, or barley. 4,094,700, Cl. 127-24.000.

Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Frolke, Wilhelm, to Boehringer Ingelheim GmbH. N-[1-(3',4'-methylenedioxy-phenyl)-propyl-(2)]-N'-phenyl-piperazines and salts thereof. 4,094,980, Cl. 424-250.000.

Restaino, Alfred J.: *See—*
Markiewitz, Kenneth H.; and Restaino, Alfred J., 4,095,019, Cl. 526-215.000.

Reynolds, Kim A.: *See—*
Cook, Lloyd A.; Reynolds, Kim A.; and Mark, Werner J., 4,094,453, Cl. 228-265.000.

Reynolds, William J.: *See—*
Gregg, James S.; and Reynolds, William J., 4,094,392, Cl. 190-41.00R.

Reznikova, Svetlana Stepanovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

Richter, Erhard; and Borsum, Dietrich, to Electroacustic GmbH. Belt-driven record player. 4,094,511, Cl. 274-39.00A.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,094,908, Cl. 260-570.00R.

Richter, Gerhard: *See—*
Stein, Klaus; Aigl, Miroslav; and Richter, Gerhard, 4,094,033, Cl. 15-41.00R.

Richter, Stephan: *See—*
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Knauft, Guenter; Richter, Stephan; and Schulze-Schoelling, Hermann, 4,095,270, Cl. 364-200.000.

Ricketts, Bobby D.: *See—*
Stewart, Dorothy A.; Ricketts, Bobby D.; and Hoelscher, Charles H., 4,094,808, Cl. 252-186.000.

Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Sirrenberg, Wilhelm; Hammann, Ingeborg; Homeyer, Bernhard; and Thomas, Herbert, 4,094,975, Cl. 424-216.000.

Riecker, Johann G., to Hartung, Kuhn & Co. Charging of an oven chamber of a battery of coke ovens. 4,094,420, Cl. 214-35.00R.

Riedel, Tilo. Icecraft. 4,094,262, Cl. 114-43.000.

Riegler, Albert; Saar, Werner; and Wiese, Volkhard, to Ciba-Geigy Corporation. Preparations for coloring molten thermoplastic polymers. 4,094,839, Cl. 260-23.00R.

Riel, Rene R.: *See—*
Castaigne, Francois; Boulet, Marcel; Riel, Rene R.; and Liber, Eric, 4,094,235, Cl. 99-450.100.

Rieter Machine Works Limited: *See—*
Furrer, Edwin, 4,094,133, Cl. 57-34.00R.

Riordan, Patrick Brian. Apparatus for the treatment of brine. 4,094,237, Cl. 99-451.000.

Risdon Manufacturing Company, The: *See—*
Sullivan, William E., 4,094,119, Cl. 53-4.000.

Roback, Joseph Philip: *See—*
Lee, Laurence Saul; and Roback, Joseph Philip, 4,094,568, Cl. 339-17.0LM.

Robert Bosch GmbH: *See—*
Bremer, Wolfgang; Heintz, Frieder; Flaig, Ulrich; Kiencke, Uwe; and Glauert, Wolfram, 4,095,179, Cl. 324-207.000.
Eheim, Franz, 4,094,201, Cl. 74-56.000.
Espenschied, Helmut, 4,094,211, Cl. 74-868.000.

Leiber, Heinz, 4,094,554, Cl. 303-52.000.
Leisner, Ernst; Ulbricht, Wolfgang; and Kaufmann, Helmut, 4,094,339, Cl. 137-604.000.
Lieckfeldt, Hans, 4,094,595, Cl. 352-180.000.
Mayer, Hermann; and Kiefer, Hans-Friedrich, 4,094,594, Cl. 352-91.00C.
Scheyhing, Hans; Fleischer, Helmut; and Abend, Karl-Ludwig, 4,094,378, Cl. 180-105.00E.
Wanner, Karl, 4,094,365, Cl. 173-117.000.
Wessel, Wolf, 4,094,186, Cl. 73-1.00G.
Wessel, Wolf; and Stein, Volkhard, 4,094,289, Cl. 123-141.000.

Robert J. Rowlands and Letha B. Rowlands, as JTWTROS: *See*—
Rowlands, Robert J., 4,094,939, Cl. 264-35.000.

Robertson, Harry J. Medical protein hydrolysate and process of using the same. 4,094,973, Cl. 424-177.000.

Robinson, Alfred D., to Delphi Instruments, Inc. Pressure regulator valve. 4,094,337, Cl. 137-505.420.

Robinson, Bertrand. Ice-skate sharpener. 4,094,101, Cl. 51-5.00D.

Robinson, Frank, to Courtaulds Limited. Method of knitting a sweater blank. 4,094,171, Cl. 66-176.000.

Robinson, Vivian Marie: *See*—
Anolick, Colin; Robinson, Vivian Marie; and Stewart, Charles Winfield, Sr., 4,095,009, Cl. 428-310.000.

Rodriguez, Jesus. Audio tape recorder, editor and amplifying system. 4,095,261, Cl. 360-13.000.

Rogers Corporation: *See*—
Sundstrom, Donald W.; and Maine, Richard L., 4,095,008, Cl. 428-215.000.

Rogers, James. Tilting assembly for pick-up head. 4,094,423, Cl. 214-147.00G.

Rohm and Haas Company: *See*—
Harrop, William H.; Witiak, David; and LaBar, Russell A., 4,094,927, Cl. 260-897.00B.
Weiler, Ernest D., 4,094,875, Cl. 260-270.0PY.

Rohr, Eduard, to Ed. Rohr AG. Furnace with heat storage elements. 4,094,302, Cl. 126-400.000.

Rohr Industries, Incorporated: *See*—
Nerem, Arne, 4,095,127, Cl. 307-253.000.

Rohringer, Peter: *See*—
Nachbur, Hermann; and Rohringer, Peter, 4,094,929, Cl. 260-968.000.

Roig, Joseph Antoine, to Agence Nationale de Valorisation de la Recherche. Closure device for locking a movable element with respect to another element. 4,094,540, Cl. 292-214.000.

Rojecki, Walter E.: *See*—
Bohusch, Glen O.; and Rojecki, Walter E., 4,094,553, Cl. 303-3.000.

Rokach, Joshua; and Reader, Grant W., to M. S. & D. (I.A.) Corp. 2-R-Substituted-1,2,5-thiadiazole-3-one antimicrobials. 4,094,986, Cl. 424-270.000.

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Braun, Rolf, 4,094,243, Cl. 101-349.000.

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Rehn, Heinz, 4,095,247, Cl. 354-286.000.

Romagnoli, Andrea. Apparatus for forming, filling and closing plastics trays. 4,094,127, Cl. 53-51.000.

Romeas, Rene, to Thomson-Brandt. Transcoder for color television signals. 4,095,254, Cl. 358-11.000.

Rosenthal, Robert D., to Neotec Corporation. Standardizing test sample. 4,095,105, Cl. 250-338.000.

Ross, Edgar A., to Southern Weaving Company. Woven shielded cable. 4,095,042, Cl. 174-36.000.

Ross, Wayne A., to United States of America, Energy. Process for solidifying high-level nuclear waste. 4,094,809, Cl. 252-301.10W.

Rossler, Frederick William, Jr.: *See*—
Dola, Frank Peter; and Rossler, Frederick William, Jr., 4,094,566, Cl. 339-14.00R.

Rostler, Fritz S., to Cabot Corporation. Asphalt cement and concrete compositions and filler compositions therefor. 4,094,697, Cl. 106-280.000.

Rotoflex Engraving Limited: *See*—
Stollenwerk, Joseph August; and Muhs, Reinhard, 4,094,474, Cl. 242-56.200.

Rottig, Walter; Tummes, Hans; Cornils, Boy; and Weber, Jurgen, to Ruhrchemie Aktiengesellschaft. Process for the production of divalent alcohols. 4,094,914, Cl. 568-862.000.

Rottloff, Gunther: *See*—
Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, 4,094,852, Cl. 260-37.00N.
Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, 4,094,861, Cl. 260-47.00P.

Rousseau, Roy Settle, to Kartridg Pak Co., The. Method for removing meat from bone fragments. 4,094,042, Cl. 17-46.000.

Rowlands, Robert J., to Robert J. Rowlands and Letha B. Rowlands, as JTWTROS. Method of repairing adobe masonry. 4,094,939, Cl. 264-35.000.

Rozmus, Walter J., to Kelsey-Hayes Company. Method of forming and subsequently heat treating articles of near net shaped from powder metal. 4,094,709, Cl. 148-126.000.

Rozsa, Peter. Dual purpose walking frame for handicapped persons. 4,094,331, Cl. 135-67.000.

Ruffner, Charles L.: *See*—
Fleck, James N.; Palmer, Richard C.; and Ruffner, Charles L., 4,094,672, Cl. 75-226.000.

Ruger, Walther, to Refeka Werbemittel GmbH. Sales packaging. 4,094,405, Cl. 206-423.000.

Ruhenstroth-Bauer, Gerhard; and Scherer, Reiner, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v. Method for simultaneous quantitative analysis of several constituents in a sample. 4,094,759, Cl. 204-180.00G.

Ruhrchemie Aktiengesellschaft: *See*—
Rottig, Walter; Tummes, Hans; Cornils, Boy; and Weber, Jurgen, 4,094,914, Cl. 568-862.000.

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Rutgerswerke Aktiengesellschaft: *See*—
Jellinek, Karl; and Oellig, Rudi, 4,094,925, Cl. 260-836.000.

Rutledge, Robert W.: *See*—
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Rybalko, Galina Ivanovna: *See*—
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

S. A. des Anciens Etablissements Paul Wurth: *See*—
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s.a Texaco Belgium n.v.: *See*—
Maes, Jean Pierre; and Molyneux, Alan, 4,095,176, Cl. 324-65.0CR.

Saad, Michel H. Shoe hanger. 4,094,030, Cl. 12-116.800.

Saar, Werner: *See*—
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Sadler, Joe A. Alarm detection and identification system. 4,095,220, Cl. 340-409.000.

St. Clair, Homer F. Lightning protection circuit. 4,095,262, Cl. 361-1.000.

Saito, Katsuhide: *See*—
Murai, Hiromu; Ohata, Katsuya; Enomoto, Hiroshi; Chokai, Shoichi; Machara, Mitsuhiro; Saito, Katsuhide; and Ozaki, Takayuki, 4,094,991, Cl. 424-309.000.

Saito, Masao: *See*—
Mizuno, Kinichi; Saito, Masao; Onda, Yuzi; Aoyama, Tetsuo; and Kato, Kumiko, 4,094,905, Cl. 260-561.00R.

Saito, Takahito, to Kabushiki Kaisha Meidensha. Low power dissipation crystal oscillator. 4,095,195, Cl. 331-116.00R.

Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; and Yasuda, Atsushi, to House Food Industrial Company Limited. Package of convenience food. 4,094,996, Cl. 426-115.000.

Sakamoto, Masaharu: *See*—
Nishikawa, Hideichi; and Sakamoto, Masaharu, 4,094,064, Cl. 30-92.000.

Saklad, Eugene L.: *See*—
Layne, Warren W.; and Saklad, Eugene L., 4,094,965, Cl. 424-1.500.

Salmond, William E.; and Auletti, Ronald L., to General Dynamics Corporation. High accuracy broadband antenna system. 4,095,230, Cl. 343-729.000.

Salmond, William G., to Upjohn Company, The. 9β,10α-Cholesta-5,7-diene-3β,25-diol. 4,094,890, Cl. 260-397.200.

Salvino, Lawrence P. Portable device for supporting a roll of aluminum sheeting for dispensing. 4,094,473, Cl. 242-55.000.

Samchuck, Daniel B.: *See*—
Stern, David L.; and Samchuck, Daniel B., 4,094,646, Cl. 23-230.00R.

Sampson, Roy John: *See*—
Lake, Ivan James Samuel; and Sampson, Roy John, 4,094,919, Cl. 260-668.00A.

Samsonite Corporation: *See*—
Gregg, James S.; and Reynolds, William J., 4,094,392, Cl. 190-41.00R.

Sandahl, Carl Ragnar: *See*—
Cook, John Stone; and Sandahl, Carl Ragnar, 4,094,580, Cl. 350-96.210.

Sanders Associaties, Inc.: *See*—
Mortimer, Thomas J., 4,095,215, Cl. 340-311.000.

Sanders, James J. Boot or shoe heating device. 4,094,080, Cl. 36-2.600.

Sanders, Robert R., to Eastman Kodak Company. Plasticized cellulose ester compositions. 4,094,695, Cl. 106-179.000.

Sanderson, Gerald D., to Allis-Chalmers Corporation. Quick release for caternary rollers. 4,094,401, Cl. 198-827.000.

Sandoz, Inc.: *See*—
Batzer, Othmer F.; and Ignoffo, Carlo M., 4,094,969, Cl. 424-78.000.
Towers, Jack E., 4,094,491, Cl. 249-83.000.

Sandoz Ltd.: *See*—
Hasspacher, Klaus; and Strasser, Michael, 4,094,987, Cl. 424-274.000.

Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Green strength of elastomers. 4,094,831, Cl. 260-5.000.

Sandvik Aktiebolag: *See*—
Lundstrom, Hans Per Olof; and Johansson, Ernst Lennart, 4,094,364, Cl. 173-80.000.

Sankyo Company Limited: *See*—
Morisawa, Yasuhiro; Kataoka, Mitsuru; Kitano, Noritoshi; and Mastuzawa, Toshiaki, 4,094,982, Cl. 424-263.000.
Sann, Robert J.; and Goldberg, Arthur, to Howe Richardson Scale Company. Load cell overload protection system for weighing scales. 4,094,368, Cl. 177-128.000.
Sano, Hiroshi, to Tomy Kogyo Co., Inc. Jumping rail. 4,094,089, Cl. 46-1.00K.
Sartori, Guido; and Savage, David W., to Exxon Research & Engineering Co. Process for removing acid gases with hindered amines and amino acids. 4,094,957, Cl. 423-223.000.
Sartorius, Rudolf: *See*—
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Sato, Yasuhisa; Tsuji, Sadahiko; and Tanaka, Katsumi, to Canon Kabushiki Kaisha. Compact zoom lens. 4,094,586, Cl. 350-184.000.
Sato, Yo, to Kabushiki Kaisha Sato Kenkyusho. Label cutting device for label applying machine. 4,094,724, Cl. 156-384.000.
Satoh, Kazuhisa: *See*—
Oyamada, Takeo; Satoh, Kazuhisa; Tsuru, Shinobu; Domoto, Masahiro; and Narisawa, Shizuo, 4,094,849, Cl. 260-29.6MQ.
Saucy, Gabriel: *See*—
Chan, Ka-Kong; and Saucy, Gabriel, 4,094,885, Cl. 260-345.500.
Chan, Ka-Kong; and Saucy, Gabriel, 4,094,892, Cl. 260-410.90R.
Sauer, Wolfgang: *See*—
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Savage, David W.: *See*—
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Savageau, Richard J., to Platt Saco Lowell Limited. Stop-motion apparatus. 4,095,062, Cl. 200-61.130.
Sawada, Daisaku: *See*—
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Sawagata, Kiyoshi, to Sony Corporation. Video signal converting system having quantization noise reduction. 4,095,259, Cl. 358-141.000.
Saxena, Brij B., to Cornell Research Foundation, Inc. Means for testing for pregnancy. 4,094,963, Cl. 424-1.000.
Scanga, Theodore P.; and Callender, Robert E., to Aluminum Company of America. Closure assembly and package. 4,094,460, Cl. 229-43.000.
Schaber, Christian: *See*—
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Schaum, Helmut; Schenk, Friedrich; Voigt, Hartmut; and Sartorius, Rudolf, to Hoechst Aktiengesellschaft. Process for preparing acetic acid. 4,094,901, Cl. 260-530.00R.
Schenectady Chemicals, Inc.: *See*—
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Schertel, Gunter: *See*—
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Scheubeck, Egmont: *See*—
Iwantscheff, Georg; and Scheubeck, Egmont, 4,094,640, Cl. 23-230.0PC.
Schexnayder, Lawrence F., to Caterpillar Tractor Co. Fluid system having load pressure equalizing valve assemblies. 4,094,228, Cl. 91-411.00B.
Scheyhing, Hans; Fleischer, Helmut; and Abend, Karl-Ludwig, to Robert Bosch GmbH. Vehicle constant speed control circuit. 4,094,378, Cl. 180-105.00E.
Schieber, Michael M.; Beinglass, Israel; and Dishon, Giora, to United States of America, Energy. Apparatus for growing HgI_2 crystals. 4,094,268, Cl. 118-49.100.
Schilke, David C.: *See*—
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Schinhammer, Karl, to Scheu-Dental Inh. Rudolf Scheu Herstellung & Vertrieb Von Dentalbedarf. Orthodontic bracket assembly. 4,094,068, Cl. 32-14.00A.
Schirmer, Henry G., to W. R. Grace & Co. Oriented nylon and laminates thereof. 4,095,012, Cl. 428-474.000.
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Schlegel, Norman H.; and Karlen, Harvey R., to Cory Food Services, Inc. Decanter handle structure. 4,094,449, Cl. 222-475.000.
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Schlumberger Technology Corporation: *See*—
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Schmidlin, Albertus E., to United States of America, Army. Switch actuator. 4,094,247, Cl. 102-228.000.
Schmidt, Henry, Jr., to Industrial Filter & Pump Mfg. Co. Distributor collector assembly. 4,094,790, Cl. 210-289.000.
Schmidt, Max Christof; and Huber, Richard, to Amann & Sohne. Thread spool. 4,094,476, Cl. 242-125.200.
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Schmitt, Frederick Louis: *See*—
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Schmitt, Werner; Purrmann, Robert; and Jochum, Peter, to ESPE Fabrik Pharmazeutischer Praparate GmbH. N,N-bis-hydroxyalkyl-3,5-di-t-butyl anilines accelerators for redox polymerization of unsaturated compounds. 4,095,018, Cl. 526-211.000.
Schneider, Urban A.; and Sigman, Robert D., to Westinghouse Electric Corp. Automatic hot filler wire welding method and apparatus. 4,095,077, Cl. 219-61.000.
Schneider, Wilma J.; and Gast, Lyle E., to United States of America, Agriculture. Triglyceride oil-derived water-dispersible urethane resin coatings. 4,094,838, Cl. 260-22.0TN.
Schnell, Ludwig Lorenz, to Schuttgutfordertechnik AG. Apparatus for conveying and separating loose material. 4,094,548, Cl. 299-9.000.
Schoeman, Marthinus Johannes. Supplying fuel to internal combustion engines. 4,094,933, Cl. 261-50.00A.
Scholefield, John. Method of staining microscopic organisms. 4,094,745, Cl. 195-103.50M.
Schonenberger, Helmut; Kranzfelder, Gerhard; and Schmitt-Wallenborn, Helga, to Klinge Pharma GmbH. Novel di-(3'-hydroxyphenyl)-alkane compounds, process of preparation and their use in medicine. 4,094,994, Cl. 424-341.000.
Schowalter, Kenneth A.: *See*—
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Schroeder, Charles W. Workman's glove. 4,094,014, Cl. 2-161.00R.
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Schwartz, James W., to Zenith Radio Corporation. Electron gun having an arc-inhibiting electrode. 4,095,138, Cl. 315-16.000.
Schwarz, Eckhard C. A., to Biax-Fiberfilm Corporation. Process for preparing novel compounds for use as fabric softeners in water solutions thereof. 4,094,796, Cl. 252-8.800.
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McGinniss, Vincent Daniel, 4,094,843, Cl. 260-29.20N.
Scott, Harley D., to Cyclops Corporation. Controlled destructive panel assembly. 4,094,108, Cl. 52-1.000.
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Sedlmair, Gerhard, to Hannes Marker. Front jaw for safety ski bindings. 4,094,530, Cl. 280-625.000.
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Seeley, Leonard, to Plastofilm Industries, Inc. Urine specimen container. 4,094,648, Cl. 23-259.000.
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Selick, David, to Selco Electronics, Inc. Light responsive switch. 4,095,100, Cl. 250-206.000.
Sella, Claude: *See—*
Boucher, Bernard; Luzet, Daniel; and Sella, Claude, 4,094,764, Cl. 204-298.000.
Sellstedt, John H.: *See—*
Teller, Daniel M.; and Sellstedt, John H., 4,094,979, Cl. 424-246.000.
Senckel, Karlheinz. Two-phase asynchronous motor. 4,095,150, Cl. 318-227.000.
Sepp, Hermann: *See—*
von Pieverling, Klaus; Sepp, Hermann; and Baier, Walter, 4,095,047, Cl. 178-69.100.
Serata, Shosei. Micro-creepmeter. 4,094,189, Cl. 73-88.00E.
Seri, Tutomu: *See—*
Shibata, Nobuho; Seri, Tutomu; Umezawa, Norio; and Morofuji, Takeshi, 4,095,166, Cl. 323-17.000.
Sevenich, Theodor: *See—*
Fabian, Wolfgang; Plumer, Werner; Sevenich, Theodor; and Zehnter, Heribert, 4,094,219, Cl. 83-345.000.
Sgroi, Ronald, to McCord, Kenneth C. Heat transfer blanket. 4,094,357, Cl. 165-105.000.
Shakespeare of Arkansas Inc.: *See—*
Weaver, Lester C., 4,094,482, Cl. 248-4.000.
Sharp Kabushiki Kaisha: *See—*
Mito, Sanai; Kinpara, Shinji; Sumitomo, Yuji; and Kobayashi, Toshio, 4,095,234, Cl. 346-75.000.
Shaughnessy, Frank J., to Stanley Works, The. Coded electronic security system. 4,095,211, Cl. 340-224.000.
Shaw, Leon O.: *See—*
Beachem, Ronald; and Covington, Dennis, 4,095,050, Cl. 179-2.00A.
Sheard, Dennis Richard; and Fisher, Ian Stuart, to Imperial Chemical Industries Limited. Polymeric phosphorus compounds and flame retardant polyethyleneterephthalate containing said polymers. 4,094,926, Cl. 260-860.000.
Shearing, Herbert Jackson, to Imperial Chemical Industries Limited. Quick setting compositions. 4,094,829, Cl. 260-2.5AK.
Sheffer Collet Company: *See—*
Piotrowski, Charles, 4,094,521, Cl. 279-4.000.
Shell Oil Company: *See—*
Allen, Roy A.; and Scott, Leroy W., 4,094,844, Cl. 260-29.300.
Blytas, George C., 4,094,355, Cl. 165-1.000.
Van Lookeren Campagne, Nicolaas, 4,094,813, Cl. 252-373.000.
Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, to United States Borax & Chemical Corporation. Morpholinobenzimidazole N-oxides. 4,094,662, Cl. 71-92.000.
Shen, Kelvin Kei-Wei, to United States Borax & Chemical Corporation. Quadricyclic morpholinobenzimidazole compounds. 4,094,663, Cl. 71-92.000.
Sherman, John Delano: *See—*
Denny, Arthur Francis; Gioffre, Anthony Joseph; and Sherman, John Delano, 4,094,778, Cl. 210-38.00A.
Sheth, Suresh: *See—*
United States of America, National Aeronautics and Space Administration; Howarth, John T.; Sheth, Suresh; Sidman, Kenneth R.; and Massucco, Arthur A., 4,094,943, Cl. 264-130.000.
Shibagaki, Masahiro: *See—*
Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, 4,094,722, Cl. 156-345.000.
Shibata, Nobuho; Seri, Tutomu; Umezawa, Norio; and Morofuji, Takeshi, to Matsushita Electric Industrial Co., Ltd. DC variable voltage device. 4,095,166, Cl. 323-17.000.
Shibuya, Michio, to Sony Corporation. Phase locked loop circuit. 4,095,191, Cl. 331-4.000.
Shibuya, Tsunenori, to Diesel Kiki Co., Ltd. Automotive air conditioner compressor. 4,094,617, Cl. 417-295.000.
Shichman, Daniel: *See—*
Ferrell, Wesley; and Shichman, Daniel, 4,094,354, Cl. 152-361.00R.
Shigeta, Toshihiko: *See—*
Kakui, Kuniaki; Shigeta, Toshihiko; and Koike, Koso, 4,094,618, Cl. 418-178.000.
Shih, Kelvin: *See—*
Hochstein, Peter A.; and Shih, Kelvin, 4,095,184, Cl. 325-22.000.
Shima, Kenji: *See—*
Tsumori, Akihiro; and Shima, Kenji, 4,095,076, Cl. 219-10.49R.
Shimada, Mitsuo: *See—*
Fujii, Yoshio; Shimada, Mitsuo; and Ohnuma, Sadabumi, 4,094,609, Cl. 356-201.000.
Shimamoto, Noboru: *See—*
Yokoyama, Kiyoshi; and Shimamoto, Noboru, 4,094,949, Cl. 264-234.000.
Shimizu, Ichio: *See—*
Yoshimura, Masayoshi; Otsuki, Keizo; Shoji, Senji; Yamada, Tomio; Shimizu, Ichio; and Arai, Yuji, 4,095,253, Cl. 357-81.000.
Shimoiizaka, Junzo. Method for preparing a water base magnetic fluid and product. 4,094,804, Cl. 252-62.520.
Shin-Etsu Chemical Co. Ltd.: *See—*
Yokoyama, Kiyoshi; and Shimamoto, Noboru, 4,094,949, Cl. 264-234.000.
Shishido, Tadao: *See—*
Tsujino, Nobuyuki; Ogawa, Akira; Shishido, Tadao; and Adachi, Keiichi, 4,094,683, Cl. 96-95.000.
Shoji, Kouichi; and Grimley, Arthur W. T., to Kaiser Resources Ltd., by said Arthur Grimley; and Mitsui Mining Co., Ltd., by said Kouichi Shoji. Process for hydraulically mining coal employing a cutting monitor and a breaking monitor. 4,094,549, Cl. 299-17.000.
Shoji, Senji: *See—*
Yoshimura, Masayoshi; Otsuki, Keizo; Shoji, Senji; Yamada, Tomio; Shimizu, Ichio; and Arai, Yuji, 4,095,253, Cl. 357-81.000.
Shroff, Bansi K.; and Shu, Stephen K., to Honeywell Inc. Dual motor tape recorder system. 4,094,478, Cl. 242-192.000.
Shu, Stephen K.: *See—*
Shroff, Bansi K.; and Shu, Stephen K., 4,094,478, Cl. 242-192.000.
Shuster, Edward J.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Shuster, Edward J.; and Schmitt, Frederick Louis, 4,094,824, Cl. 252-522.000.
Hall, John B.; Hruza, Denis E.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 4,094,823, Cl. 252-522.000.
Shutt, George V. Method and apparatus for perforating elongate members. 4,095,084, Cl. 219-121.0LM.
Siblik, Allen D., to MacLean-Fogg Lock Nut Co. Detentable automatic hatch latch apparatus. 4,094,542, Cl. 292-256.500.
Sidaravichus, Jonas-Donatos Bronyaus: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.
Sidman, Kenneth R.: *See—*
United States of America, National Aeronautics and Space Administration; Howarth, John T.; Sheth, Suresh; Sidman, Kenneth R.; and Massucco, Arthur A., 4,094,943, Cl. 264-130.000.
Siemens Aktiengesellschaft: *See—*
Aichinger, Horst; and Ebersberger, Hans, 4,095,109, Cl. 250-374.000.
Behn, Reinhard; Loebl, Harald; and Preissinger, Karl-Heinz, 4,095,199, Cl. 333-70.00R.
Felkel, Gerfried; Maier, Gerhard; Guenzel, Wolfgang; and Waitl, Guenther, 4,095,116, Cl. 250-551.000.
Greischel, Christoph; Harand, Elmar; Maritsch, Franz; and Michel, Eberhard, 4,094,737, Cl. 176-65.000.
Iwantscheff, Georg; and Scheubeck, Egmont, 4,094,640, Cl. 23-230.0PC.
Kattner, Erich; Guntersdorfer, Max; and Heinzl, Joachim, 4,095,238, Cl. 346-140.00R.
Keprda, Jaroslav, 4,095,060, Cl. 200-16.00D.
Lesche, Wolfgang, 4,095,203, Cl. 336-20.000.
Mourick, Paul, 4,095,151, Cl. 318-266.000.
Taumann, Leonhard, 4,095,114, Cl. 250-510.000.

von Pieverling, Klaus; Sepp, Hermann; and Baier, Walter, 4,095,047, Cl. 178-69.100.

Sigman, Robert D.: *See—*
Schneider, Urban A.; and Sigman, Robert D., 4,095,077, Cl. 219-61.000.

Sigwalt, Pierre: *See—*
Baudin, Cecile; Miskovic, Mihajlo; Polton, Alain; and Sigwalt, Pierre, 4,094,830, Cl. 260-4.00R.

Silverman, Ronald: *See—*
Bhattacharyya, Arup; and Silverman, Ronald, 4,094,057, Cl. 29-571.000.

Simms, Larry Lee. Concealed safety latch assembly. 4,094,541, Cl. 292-231.000.

Simms, Robert A.; and Feaster, Gene R., to Westinghouse Electric Corp. Method of fabricating an electron tube. 4,094,563, Cl. 316-19.000.

Simoni, Donald J. Beehive. 4,094,026, Cl. 6-1.000.

Simpson, Kenneth A., to C & K Components, Inc. Miniature pushbutton switch. 4,095,070, Cl. 200-153.00J.

Simpson Manufacturing Co., Inc.: *See—*
Gilb, Tyrell T., 4,094,116, Cl. 52-693.000.

Singer Company, The: *See—*
Ketterer, Stanley J.; and Edwards, William J., 4,094,261, Cl. 112-228.000.

Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono. Photosensitive polymeric material and electrophotometric material prepared by reacting secondary aromatic amine with vinyl alkylether or vinyl acetate in the presence of strong acid and Hg (II) or Pb (IV) catalyst. 4,095,032, Cl. 526-11.100.

Sirrenberg, Wilhelm: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Sirrenberg, Wilhelm; Hammann, Ingeborg; Homeyer, Bernhard; and Thomas, Herbert, 4,094,975, Cl. 424-216.000.

Sisk, Francis J., to Electric Power Research Institute, Inc. Loss heat suppression apparatus and method for heat pump. 4,094,165, Cl. 62-115.000.

Siskin, Michael; and Mayer, Ivan, to Exxon Research & Engineering Co. Process for the alkylation of light paraffins with lower olefins. 4,094,924, Cl. 260-683.510.

Siwersson, Olle Lennart; Wall, Arne Evert; and Nilsson, Olle, to AB S. T. Powercell. Galvanic processes and anodes for carrying the processes into effect. 4,095,015, Cl. 429-15.000.

Sizova, Ljubov Sergeevna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

SKF Kugellagerfabriken GmbH: *See—*
Koder, Walter; and Hillmann, Reinhart, 4,094,394, Cl. 192-98.000.

Slocum, Chester D., Jr. Electrical storm forecast system. 4,095,221, Cl. 340-421.000.

Slusarski, Ronald S., to Textron Inc. Flanged bearing cartridge. 4,094,559, Cl. 308-194.000.

Smith, David A.; and Davidson, John J., to Aluminum Company of America. Method and apparatus for differentially and simultaneously electrocoating the interior and exterior of a metal container. 4,094,760, Cl. 204-181.00R.

Smith, Donald L. Ventilated toilet seat. 4,094,023, Cl. 4-213.000.

Smith, Edward A.; and Day, Robert L. Metal door frame and trim clip. 4,094,112, Cl. 52-211.000.

Smith, Eugene J. Method and apparatus for oxygenating aerobically decomposable liquors. 4,094,774, Cl. 210-12.000.

Smith, Hubert Stacy, Jr., to Dow Chemical Company, The. Improved foam deposition apparatus. 4,094,622, Cl. 425-224.000.

Smith, James A. Support for dispensing packages. 4,094,416, Cl. 211-71.000.

Smith, JaMi: *See—*
Kolker, Carl R.; Campbell, John Scott; La Fond, Robert L.; and Smith, JaMi, 4,095,248, Cl. 358-288.000.

Smith, Lester F.: *See—*
Lemberger, Earl S.; Olson, Robert K.; and Smith, Lester F., 4,094,814, Cl. 252-415.000.
Olson, Robert K.; and Smith, Lester F., 4,094,817, Cl. 252-415.000.

SmithKline Corporation: *See—*
Anderson, Elvin Lowell; and Connelly, Gerald Aloysius, 4,094,900, Cl. 260-520.00E.
Berges, David A., 4,094,881, Cl. 260-308.00A.

SMW-Spanneinrichtungen Schneider & Weisshaupt, Firma: *See—*
Hiestand, Karl, 4,094,522, Cl. 279-4.000.

Snap-on Tools Corporation: *See—*
Jindrick, James A., 4,094,190, Cl. 73-115.000.
Schmitt, Herbert R., 4,095,170, Cl. 324-16.00T.

Snell, George J.; and Long, Raymond H., to Lummus Company, The. Separation of solids from tar sands extract. 4,094,781, Cl. 210-54.000.

Snyder, Herbert Clarke, to Sonoco Products Company. Partitions with releasable gripping edges. 4,094,454, Cl. 229-15.000.

Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Cocuzza, Gioacchino; and Musso, Giuseppe, 4,094,962, Cl. 423-573.00R.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Carubia, Giovanni; Papa, Roberto; and Pratelli, Cesare, 4,095,266, Cl. 364-200.000.

Societe Anonyme belge d'exploitation de la navigation aerienne (SABENA): *See—*
de Barros, Ruy F. M., 4,094,570, Cl. 339-75.00M.

Societe Anonyme des Usines Chausson: *See—*
Plegat, Alain Edouard, 4,094,184, Cl. 72-392.000.

Societe Anonyme Francaise du Ferodo: *See—*
Neveux, Rene, 4,094,358, Cl. 165-154.000.

Societe Chimique des Charbonnages: *See—*
Baudin, Cecile; Miskovic, Mihajlo; Polton, Alain; and Sigwalt, Pierre, 4,094,830, Cl. 260-4.00R.

Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
Leuba, Jean-Louis, 4,094,743, Cl. 195-63.000.

Societe d'Etudes de Machines Thermiques S.E.M.T.: *See—*
Bastenhof, Dirk, 4,094,465, Cl. 239-132.300.

Societe d'Exploitation de Brevets J.B.: *See—*
Hancu, Theodore, 4,094,038, Cl. 15-250.320.

Societe Francaise d'Equipements pour la Navigation Aerienne S.F.E.N.A.: *See—*
Chombard, Pierre Andre, 4,094,200, Cl. 74-5.00R.

Societe Francaise des Telephones Ericsson: *See—*
Anizan, Pierre; Ducournau, Jean Paul; Gilberton, Paul; and Mevel, Yves, 4,095,054, Cl. 179-18.0ES.

Societe Nationale des Poudres et Explosifs: *See—*
Bellouin, Francois C.; and Dremierre, Jean G., 4,094,188, Cl. 73-81.000.

Societe Nationale Elf Aquitaine: *See—*
Moinard, Michel; Leturcq, Michel; and Delcroix, Catherine, 4,094,161, Cl. 61-95.000.

Societe Orogil: *See—*
Soula, Gerard; and Duteurtre, Philippe, 4,094,802, Cl. 252-51.50A.

Soderberg, John Lennart, to Pharmacia Fine Chemicals AB. Vinylic group containing dextran derivative gel for use in electrophoretic separation processes. 4,094,832, Cl. 260-17.4GC.

Soderberg, John Lennart: *See—*
Johansson, Haldor Ingemar; Lindstrom, Dag Torsten; and Soderberg, John Lennart, 4,094,833, Cl. 260-17.4GC.

Sogo, Yoshitaka; and Ida, Shuichiro, to Tokyo Jidosha Kogyo Kabushiki Kaisha. Gear transmission. 4,094,206, Cl. 74-360.000.

Sokolov, Boris Grigorievich; and Zaboronok, Georgy Fomich. Electron-beam apparatus for thermal treatment by electron bombardment. 4,095,083, Cl. 219-121.0EB.

Sonoco Products Company: *See—*
Snyder, Herbert Clarke, 4,094,454, Cl. 229-15.000.

Sonstegard, David Ansel: *See—*
Matthews, Larry Stanford; Kaufer, Herbert; and Sonstegard, David Ansel, 4,094,017, Cl. 3-1.911.

Sony Corporation: *See—*
Sawagata, Kiyoshi, 4,095,259, Cl. 358-141.000.
Shibuya, Michio, 4,095,191, Cl. 331-4.000.

Sorenson, Edward Fredrick; and Sorenson, Edward Fredrick, Jr. Solar collector panel. 4,094,301, Cl. 126-271.000.

Sorenson, Edward Fredrick, Jr.: *See—*
Sorenson, Edward Fredrick; and Sorenson, Edward Fredrick, Jr., 4,094,301, Cl. 126-271.000.

Soula, Gerard; and Duteurtre, Philippe, to Societe Orogil. Novel lubricant additives. 4,094,802, Cl. 252-51.50A.

Southern Saw Service, Inc.: *See—*
Harris, Thomas D., 4,094,106, Cl. 51-214.000.

Southern Weaving Company: *See—*
Ross, Edgar A., 4,095,042, Cl. 174-36.000.

Spaine, David L. Pallet pulling device. 4,094,544, Cl. 294-82.00R.

Spaman, Donald R.; and Schilke, David C., to Raymond Engineering Inc. Reel-to-reel drive with speed control. 4,095,146, Cl. 318-7.000.

Spampinato, Dominic P.: *See—*
Dennard, Robert H.; and Spampinato, Dominic P., 4,095,251, Cl. 357-23.000.

Spector, Sidney: *See—*
Jarrott, Bevyn; and Spector, Sidney, 4,094,964, Cl. 424-1.000.

Speer, Richard. Ball projecting device. 4,094,294, Cl. 124-56.000.

Sperber, Martin, to Blonder-Tongue Laboratories, Inc. Apparatus for decoding scrambled television and similar transmissions. 4,095,258, Cl. 358-120.000.

Sperry, Philip R.; and Mandigo, Frank N., to Swiss Aluminium Ltd. Aluminum alloys possessing improved resistance weldability. 4,094,705, Cl. 148-2.000.

Sperry Rand Corporation: *See—*
DeWalt, Michael P., 4,094,481, Cl. 244-194.000.
Kennedy, Thomas W., Jr., 4,094,479, Cl. 244-179.000.
Lins, Stanley James, 4,095,279, Cl. 365-29.000.
McMahon, Donald H.; and Nelson, Arthur R., 4,094,579, Cl. 350-96.170.
Oswald, Robert Clement, 4,095,137, Cl. 315-13.00C.

Spes, Hellmuth: *See—*
Liberda, Heinz; Spes, Hellmuth; and Trommet, Alfred, 4,094,902, Cl. 260-551.00P.

Spicer, Denis Frank, to Texas Instruments Incorporated. Method and

apparatus for displaying alphanumeric data. 4,095,216, Cl. 340-324.0AD.

Spillson, George A., to Consolidated Packaging Corporation. Collapsible drum-type container. 4,094,457, Cl. 229-21.000.

Spintiller International Limited: *See*—
McCoomb, John Michael, 4,094,363, Cl. 172-349.000.

Spitz, Erich; and Bismuth, Guy, to Thomson-CSF. High-resolution, wide-field holographic lens. 4,094,577, Cl. 350-3.720.

Spivack, John D., to Ciba-Geigy Corporation. Hindered phenyl phosphites. 4,094,855, Cl. 260-45.8NT.

Spokas, Romas Balys, to Borg-Warner Corporation. Clutch mechanism. 4,094,393, Cl. 192-82.00T.

Spranger, Douglas M.; Brookes, Malcolm J.; and Mulhauser, Paul J., to Seiko Time Corporation. Sample display tray. 4,094,409, Cl. 206-566.000.

Square D Company: *See*—
Harris, Geoffrey John, 4,095,177, Cl. 324-164.000.

Stahrlinger, Anton: *See*—
Altendorfer, Alois; and Stahrlinger, Anton, 4,094,418, Cl. 214-1.0BC.

Stamicarbon, B.V.: *See*—
Boesten, Wilhelmus H. J., 4,094,904, Cl. 260-558.00A.
Von den Hoff, Johan P. H., 4,094,909, Cl. 206-586.00P.

Standard Oil Company: *See*—
Bartek, Joseph P.; and Grasselli, Robert K., 4,094,922, Cl. 260-671.00C.
Partenheimer, Walter, 4,094,816, Cl. 252-415.000.

Standard Oil Company (Indiana): *See*—
Feinstein, Allen I.; Kane, Shantaram G.; and Fields, Ellis K., 4,094,912, Cl. 568-802.000.
Fields, Ellis K., 4,095,029, Cl. 560-87.000.
Warne, Thomas M., 4,094,800, Cl. 252-32.70E.

Stange, Ronald R.; McGuire, Samuel B.; and Woodring, Thomas W., to Tools for Bending, Inc. Surface treatment with durable low-friction material. 4,094,749, Cl. 204-25.000.

Stanhay (Ashford) Limited: *See*—
Willis, Robert Anthony, 4,094,444, Cl. 221-266.000.

Stanley Works, The: *See*—
Shaughnessy, Frank J., 4,095,211, Cl. 340-224.000.

Stapp, Paul R., to Phillips Petroleum Company. Isomerization of diacyloxyolefins. 4,095,030, Cl. 560-100.000.

Stapp, Paul R., to Phillips Petroleum Company. Method for the oxidation of a conjugated diolefin. 4,095,037, Cl. 560-246.000.

Stauffer Chemical Company: *See*—
Fancher, Llewellyn W., 4,094,974, Cl. 424-200.000.
Tilles, Harry, 4,094,895, Cl. 260-455.00A.

Steed, Earl B. Dressing holder for small game. 4,094,041, Cl. 17-44.200.

Stein, Klaus; Aigl, Miroslav; and Richter, Gerhard, to Vorwerk & Co. Interholding GmbH. Cleaning device. 4,094,033, Cl. 15-41.00R.

Stein, Volkhard: *See*—
Wessel, Wolf; and Stein, Volkhard, 4,094,289, Cl. 123-141.000.

Steinberger, David I., to Body Guard Inc. Sound-absorption panel. 4,094,379, Cl. 181-284.000.

Sterling Drug Inc.: *See*—
Crounse, Nathan N.; and Schmidt, Paul J., 4,094,877, Cl. 260-293.580.

Stern, David L.; and Samchuck, Daniel B., to Baltimore Spice Company, The. Rapid method of assaying collagen in meat and meat products. 4,094,646, Cl. 23-230.00R.

Stevenson, Curtis A. Coupling device and method. 4,094,045, Cl. 24-131.00C.

Stewart, Charles Winfield, Sr.: *See*—
Anolick, Colin; Robinson, Vivian Marie; and Stewart, Charles Winfield, Sr., 4,095,009, Cl. 428-310.000.

Stewart, Dorothy A.; Ricketts, Bobby D.; and Hoelscher, Charles H., to PPG Industries, Inc. Solubility stable encapsulated diperisophthalic acid compositions. 4,094,808, Cl. 252-186.000.

Stichting Energieonderzoek Centrum Nederland: *See*—
Ruiter, Johannes Petrus, 4,094,370, Cl. 177-168.000.

Stiron Chemical Industry Co. Ltd.: *See*—
Ono, Tasuku, 4,094,094, Cl. 46-232.000.

Stoffers, Helmut; and George, Rudolf, to Hauni-Werke Korber & Co. KG. Method and apparatus for making wrappers for cigar bunches. 4,094,325, Cl. 131-21.00R.

Stogdill, Ronald G.: *See*—
Kime, Donald L.; and Stogdill, Ronald G., 4,094,513, Cl. 277-41.000.

Stollenwerk, Joseph August; and Muhs, Reinhard, to Rotoflex Engraving Limited. Slitting apparatus. 4,094,474, Cl. 242-56.200.

Stone & Webster Engineering Corporation: *See*—
Nelson, Hazen E., 4,094,148, Cl. 60-652.000.

Stora Kopparbergs Bergslags AB: *See*—
Collin, Per Harald; and Widell, Bjorn, 4,094,665, Cl. 75-11.000.

Strand, William. Vehicle antenna tester. 4,095,172, Cl. 324-51.000.

Strasser, Michael: *See*—
Hasspacher, Klaus; and Strasser, Michael, 4,094,987, Cl. 424-274.000.

Stratton, Paul E. Vise for fly tying, small parts and the like. 4,094,497, Cl. 269-71.000.

Straub, William D.: *See*—
Gupta, Tapan K.; and Straub, William D., 4,094,061, Cl. 29-612.000.

Straus, Alan E., to Chevron Research Company. Maleic anhydride process. 4,094,888, Cl. 260-346.750.

Strauss, Carl R.: *See*—
Zellar, Wade V.; and Strauss, Carl R., 4,095,010, Cl. 428-375.000.

Street, Vern A.: *See*—
Reed, Robert D.; and Street, Vern A., 4,094,632, Cl. 431-202.000.

Strik, Francis Bernardus, to U.S. Philips Corporation. Electrophotographic preparation of color television display tube including rinsing phosphor pattern with solution of antistatic agent in apolar solvent. 4,095,134, Cl. 313-470.000.

Striplin, Charles D., to Striplin Machine & Engineering Company. Lettuce harvester. 4,094,238, Cl. 99-643.000.

Striplin Machine & Engineering Company: *See*—
Striplin, Charles D., 4,094,238, Cl. 99-643.000.

Strojarske a metalurgicke zavody: *See*—
Italy, Pavel; Kilik, Ondrej; Barancok, Jozef; and Miski, Anton, 4,094,144, Cl. 60-445.000.

Struger, Odo J.; Searcy, William W.; and John, Ernest F., to Allen-Bradley Company. Malfunction detection system for a programmable controller. 4,095,094, Cl. 235-304.100.

Sturm, Karl Gunter; and Bruning, Klaus, to Dynamit Nobel Aktiengesellschaft. Partially crystalline copolyesters useful as adhesives. 4,094,721, Cl. 156-309.000.

Sugerman, Gerald: *See*—
Monte, Salvatore J.; and Sugerman, Gerald, 4,094,853, Cl. 260-40.00R.

Sugier, Andre; and la Villa, Florentino, to Institut Francais du Petrole. Process for removing mercury from a gas or a liquid by absorption on a copper sulfide containing solid mass. 4,094,777, Cl. 210-32.000.

Sugisawa, Ko: *See*—
Sakakibara, Sakuichi; Sugisawa, Ko; Kimura, Takashi; and Yasuda, Atsushi, 4,094,996, Cl. 426-115.000.

Sugitani, Hatuo: *See*—
Omori, Eiji; Aimono, Yuuji; Mukoyama, Yoshiyuki; and Sugitani, Hatuo, 4,094,835, Cl. 260-22.0CB.

Sullivan, John L.: *See*—
Bowers, Lewis H.; Jankowski, Raymond E.; and Sullivan, John L., 4,094,834, Cl. 260-19.0UA.

Sullivan, William E., to Risdon Manufacturing Company, The. Method of making a product for dispensing a volatile substance. 4,094,119, Cl. 53-4.000.

Sultan, Stig Bertil: *See*—
Amberntsson, Jan Roger; Andersson, Roger Ingemar; and Sultan, Stig Bertil, 4,095,237, Cl. 346-140.00R.

Sumimoto, Mitsuhiro; and Kohama, Haruo, to Dai Nippon Insatsu Kabushiki Kaisha. Indicator for ethylene oxide gas. 4,094,642, Cl. 23-254.00R.

Sumitomo Chemical Company, Limited: *See*—
Harada, Taro; Okita, Taisuke; Hara, Takahisa; and Ikezawa, Yuji, 4,094,854, Cl. 260-42.460.
Nakai, Setsuo; and Ochi, Hiroshi, 4,094,942, Cl. 264-102.000.
Oyamada, Takeo; Satoh, Kazuhisa; Tsuru, Shinobu; Domoto, Masahiro; and Narisawa, Shizuo, 4,094,849, Cl. 260-29.6MQ.
Yasui, Seimei; Hino, Minoru; and Hayashi, Kazuya, 4,094,836, Cl. 260-22.0CB.

Sumitomo, Yasusuke: *See*—
Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, 4,094,722, Cl. 156-345.000.

Sumitomo, Yuji: *See*—
Mito, Sanai; Kinpara, Shinji; Sumitomo, Yuji; and Kobayashi, Toshio, 4,095,234, Cl. 346-75.000.

Sun Electric Corporation: *See*—
McLeod, Fenwick R., Jr., 4,095,178, Cl. 324-169.000.

Sunderlin, Frank. CB radio mounting bracket. 4,094,486, Cl. 248-225.400.

Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, to Bayer Aktiengesellschaft. Process for the production of polytriazines in the presence of high-boiling esters. 4,094,852, Cl. 260-37.00N.

Sundermann, Rudolf; Rottloff, Gunther; Grigat, Ernst; and Putter, Rolf, to Bayer Aktiengesellschaft. Process for the production of non-inflammable polytriazines. 4,094,861, Cl. 260-47.00P.

Sundstrand Corporation: *See*—
Bracken, Robert L., 4,094,613, Cl. 415-17.000.

Sundstrand Data Control, Inc.: *See*—
Holdren, Frederick V.; Hugli, Hans W.; Kubler, John M.; Larson, Martin E.; and Van Schoiack, Michael M., 4,094,199, Cl. 73-517.00B.
Muller, Hans Rudolf, 4,095,271, Cl. 364-434.000.

Sundstrom, Donald W.; and Maine, Richard L., to Rogers Corporation. Syntactic foam matrix board. 4,095,008, Cl. 428-215.000.

Suntech, Inc.: *See*—
Thomas, Jeffrey R., 4,094,916, Cl. 260-666.00A.
Thomas, Jeffrey R., 4,094,917, Cl. 260-666.00A.

Sutton, Douglas Leslie, to British Leyland UK Limited. Internal combustion engine. 4,094,283, Cl. 123-119.00A.

Suzuki, Hirofumi, to Hitachi, Ltd. Color picture tube device. 4,095,260, Cl. 358-248.000.

Suzuki, Kazuo; and Kataoka, Hiroyuki, to Hitachi, Ltd. Speed command generator for elevator. 4,094,386, Cl. 187-29.00R.

Suzuki, Masao. Machine for shearing and compressing scrap metals. 4,094,240, Cl. 100-97.000.

Svenska Geotherm Aktiebolag: *See*—
Madsen, Henning Brinch, 4,094,167, Cl. 62-238.000.

Swann, Wayne Elliott: *See*—
Hartdegen, Frank Joseph; and Swann, Wayne Elliott, 4,094,744, Cl. 195-63.000.

Sway-A-Way Corporation: *See*—
Johnson, William A.; Pausmer, Philip W.; and Harmon, Russel J., 4,094,532, Cl. 280-695.000.

Swiss Aluminium Ltd.: *See—*
Sperry, Philip R.; and Mandigo, Frank N., 4,094,705, Cl. 148-2.000.
Symens, Raymond D.; Queneau, Paul B.; Chou, Eddie C. J.; and Clark, Franklin F., to Amax Inc. Leaching of Ni-Cu-Fe-S matte. 4,094,754, Cl. 204-108.000.
Symonds, Alan P.; and Durfee, William K. Light control system. 4,095,139, Cl. 315-153.000.
Synergetics, Inc.: *See—*
Zerfahs, Arthur S.; and Jurin, Robert J., 4,094,104, Cl. 51-76.00R.
Syntex (U.S.A.) Inc.: *See—*
Beeby, Philip J., 4,094,978, Cl. 424-246.000.
Synthelabo: *See—*
Kaplan, Jean-Pierre; Jalfre, Maurice; and Giudicelli, Don Pierre Rene Lucien, 4,094,992, Cl. 424-324.000.
Szeberenyi, Szabolcs: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,094,908, Cl. 260-570.00R.
Szporny, Laszlo: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,094,908, Cl. 260-570.00R.
Tachikawa, Kyoji; and Itoh, Kikuo, to National Research Institute for Metals. Method for producing composite superconductors. 4,094,059, Cl. 29-599.000.
Taguchi, Kyoji: *See—*
Tani, Hirotsugu; Taguchi, Kyoji; and Arita, Shigeru, 4,095,217, Cl. 340-324.00R.
Taguchi, Tetsuya: *See—*
Tsunekawa, Tokuichi; Uchidoi, Masanori; Nakamura, Zenzo; Taguchi, Tetsuya; Aizawa, Hiroshi; and Uchiyama, Takashi, 4,095,242, Cl. 354-33.000.
Takada, Juichiro, to Takata Kojyo Co., Ltd. Seat belt buckle. 4,094,046, Cl. 24-230.0AK.
Takada, Juichiro, to Takata Kojyo Co. Ltd. Automatic locking safety belt retractor. 4,094,475, Cl. 242-107.40A.
Takagi, Tadao; Yagi, Toru; Ehara, Mitsuo; and Yamada, Tatsumi, to Honda Giken Kogyo Kabushiki Kaisha. Hot starter system for engines. 4,094,292, Cl. 123-179.00G.
Takahashi, Naoyuki, to Olympus Optical Co., Ltd. Switch controller. 4,095,123, Cl. 307-115.000.
Takahashi, Satomi: *See—*
Yamada, Hideaki; Takahashi, Satomi; and Yoneda, Koji, 4,094,741, Cl. 195-29.000.
Takahashi, Yukishige: *See—*
Fujita, Hiroshi; Kubota, Munetaka; Makita, Takashi; and Takahashi, Yukishige, 4,094,151, Cl. 61-36.00A.
Takano, Hiroshi; Yoshino, Masatsugu; Naka, Hiroshi; Ito, Yoshinobu; and Matsushika, Tadao, to Asahi Kasei Kogyo Kabushiki Kaisha. Non-silver salt type photosensitive composition. 4,094,676, Cl. 96-90.00R.
Takata Kojyo Co., Ltd.: *See—*
Takada, Juichiro, 4,094,046, Cl. 24-230.0AK.
Takada, Juichiro, 4,094,475, Cl. 242-107.40A.
Takeda, Shinji; Kobayashi, Shoji; and Watanabe, Yutaka, to Aisin Seiki Kabushiki Kaisha. Decorative trim strip. 4,094,056, Cl. 29-527.200.
Takeda, Shinji; Mitsui, Noriyoshi; and Kato, Nobuharu, to Aisin Seiki Kabushiki Kaisha. Apparatus for hot gas welding of a pair of thermoplastic materials. 4,094,725, Cl. 156-497.000.
Takefman, Bram A.; and Baxter, Donald C. Display carton. 4,094,403, Cl. 206-45.130.
Takemae, Hisao: *See—*
Yokoyama, Tsuneo; Yajima, Toshiyuki; Tsuchiya, Kazumichi; and Takemae, Hisao, 4,095,244, Cl. 354-82.000.
Talbert, David F., to Westvaco Corporation. Strip core sheet length control. 4,094,720, Cl. 156-304.000.
Tamaru, Sinji: *See—*
Tatemoto, Masayoshi; and Tamaru, Sinji, 4,094,826, Cl. 260-2.20R.
Tamesui, Tsuyoshi: *See—*
Hatanaka, Shiro; Tamesui, Tsuyoshi; and Matsuura, Tsuneharu, 4,094,105, Cl. 51-101.00R.
Tamm, Rolf Gunther Arnold, to Bodenseewerk Perkin-Elmer & Co., GmbH. Apparatus for flameless atomization of a sample for atomic absorption analysis. 4,094,607, Cl. 356-85.000.
Tanabe, Yasuo, to Mitsubishi Chemical Industries, Ltd. Process for preparing cyclic ethers. 4,094,887, Cl. 260-346.110.
Tanada, Tetsunori, to Kabushiki Kaisha Mitutoyo Seisakusho. Micrometer head with double counter. 4,094,070, Cl. 33-166.000.
Tanai, Kunio; Nakayama, Yasuaki; Hirai, Yoshiro; Aoyama, Shigeru; and Kashima, Yoshinobu, to Citizen Watch Company Limited. Rotor assembly for electro-mechanical transducer of electronic timepiece. 4,095,129, Cl. 310-49.00R.
Tanaka, Honami: *See—*
Noguchi, Kosaku; Yoshimura, Kiyoharu; Tanaka, Honami; and Hayashi, Masao, 4,094,776, Cl. 210-27.000.
Tanaka, Katsumi: *See—*
Sato, Yasuhisa; Tsuji, Sadahiko; and Tanaka, Katsumi, 4,094,586, Cl. 350-184.000.
Tanaka, Kunihiko; Kurita, Masaru; and Nishiwaki, Osamu, to Fujisawa Pharmaceutical Co., Ltd. 7-(β-Aminoacylamino)-3-heterocyclic-thiomethyl-3-cephem-4-carboxylic acid derivatives. 4,094,872, Cl. 544-26.000.
Tani, Hirotsugu; Taguchi, Kyoji; and Arita, Shigeru. Combined liquid crystal display and photovoltaic converter. 4,095,217, Cl. 340-324.00R.
Tanigaki, Hidetoshi, to Furuno Electric Co., Ltd. Push-pull switching circuit with minority carrier storage delay. 4,095,128, Cl. 307-254.000.
Taniguchi, Koichi: *See—*
Okamoto, Atutoshi; Taniguchi, Koichi; Nakano, Yoshiaki; and Toyama, Koichi, 4,094,556, Cl. 303-109.000.
Tanihata, Akio: *See—*
Nakagawa, Yohachiro; and Tanihata, Akio, 4,094,728, Cl. 156-514.000.
Tanquary, A. Charles, to Chevron Research Company. Spinning of polypyrrolidone. 4,094,945, Cl. 264-184.000.
Tate, Jack F.; and Maddox, Jim, Jr., to Texaco Inc. Oil recovery process usable in high temperature formations containing high salinity water which may include high concentrations of polyvalent ions. 4,094,798, Cl. 252-8.55D.
Tatemoto, Masayoshi; and Tamaru, Sinji, to Daikin Kogyo Co., Ltd. Fluorinated graft cation exchange copolymers. 4,094,826, Cl. 260-2.20R.
Taumann, Leonhard, to Siemens Aktiengesellschaft. Arrangement for scattering electrons. 4,095,114, Cl. 250-510.000.
Tauszig, Julio G., to A. B. Dick Company. Electronic stencil engraving machine stylus and support. 4,095,236, Cl. 346-139.00C.
Taylor, Julian S. Ocean thermal energy conversion valve. 4,094,334, Cl. 137-219.000.
Taylor, Lynn J., to Owens-Illinois, Inc. Photochemical modification of polymers. 4,094,756, Cl. 204-159.180.
Tele-Path Industries, Inc.: *See—*
Ewen, Joel J., 4,095,056, Cl. 179-18.0DA.
Teledyne Industries, Inc.: *See—*
Hudson, Raymond A., 4,094,311, Cl. 128-66.000.
Teledyne McCormick Selph, an operating division of Teledyne Industries, Inc.: *See—*
Goddard, Terrence P.; Thatcher, Donald N.; and Garrison, Charles G., 4,094,712, Cl. 149-10.000.
Telefonaktiebolaget L M Ericsson: *See—*
Erikmats, Erik Osten, 4,095,225, Cl. 343-17.2PC.
Teller, Daniel M.; and Sellstedt, John H., to American Home Products Corporation. Orally active cephalosporins. 4,094,979, Cl. 424-246.000.
Templeton, L. F.: *See—*
Orr, F. D., Jr.; Templeton, L. F.; and Keutzer, Larry L., 4,095,115, Cl. 250-538.000.
Teranishi, Haruo: *See—*
Ishikawa, Toshikatsu; Kanemaru, Toyonosuke; Teranishi, Haruo; and Onishi, Kazumasa, 4,094,951, Cl. 264-325.000.
Teranishi, Takao: *See—*
Oyama, Yoshishige; Teranishi, Takao; and Yamauchi, Teruo, 4,094,285, Cl. 123-119.00A.
Terranova, A. P.; and Murphy, F. J., to United States of America, Army. Display of variable length vectors. 4,095,145, Cl. 315-383.000.
Texaco Development Corporation: *See—*
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,095,022, Cl. 544-87.000.
Klein, Howard P., 4,094,828, Cl. 260-2.5AM.
McEntire, Edward E., 4,094,827, Cl. 260-2.5AC.
Texaco Inc.: *See—*
Tate, Jack F.; and Maddox, Jim, Jr., 4,094,798, Cl. 252-8.55D.
Texas Instruments Incorporated: *See—*
Miles, Larry L., 4,095,093, Cl. 235-92.0GT.
Reinberg, Alan R.; and Rao, Rao K., 4,094,732, Cl. 156-643.000.
Spicer, Denis Frank, 4,095,216, Cl. 340-324.0AD.
Weirauch, Donald F., 4,094,677, Cl. 96-36.000.
Textron Inc.: *See—*
Slusarski, Ronald S., 4,094,559, Cl. 308-194.000.
Thatcher, Donald N.: *See—*
Goddard, Terrence P.; Thatcher, Donald N.; and Garrison, Charles G., 4,094,712, Cl. 149-10.000.
Thermo-Seal, Inc.: *See—*
Numbers, Jody L., 4,094,433, Cl. 220-90.400.
Theurer, Josef; and Brunninger, Manfred, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Apparatus for laying track. 4,094,249, Cl. 104-6.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track tamping machine. 4,094,250, Cl. 104-12.000.
Theurer, Josef, to Frank Plasser Bahnbaummaschinen-Industriegesellschaft m.b.H. Mobile track tamping machine. 4,094,251, Cl. 104-12.000.
Thiele, August: *See—*
Rehbein, Friedhelm, 4,094,141, Cl. 59-93.000.
Thiot, Phyllis J.: *See—*
Thiot, Richard E.; and Thiot, Phyllis J., 4,094,414, Cl. 211-1.300.
Thiot, Richard E.; and Thiot, Phyllis J. Clothes hanging rack. 4,094,414, Cl. 211-1.300.
Thir, Basil: *See—*
Newkirk, David Dudley; Login, Robert Bernard; and Thir, Basil, 4,094,797, Cl. 252-8.900.
Thomas, Alfred: *See—*
Daubenbuschel, Werner; Thomas, Alfred; Hess, Dieter; and Augst, Hans-Rudiger, 4,094,620, Cl. 425-140.000.
Thomas, David C., to Kerr-McGee Corporation. Aqueous slurry of ash concentrate composition and process for producing same. 4,094,810, Cl. 252-313.00R.
Thomas, Gareth John, to Hoffmann-La Roche Inc. Plant growth regulating agents. 4,094,664, Cl. 71-115.000.

Thomas, Herbert: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Schroder, Rolf; Sirrenberg, Wilhelm; Hammann, Ingeborg; Homeyer, Bernhard; and Thomas, Herbert, 4,094,975, Cl. 424-216.000.

Thomas, Hermann, to Maschinenfabrik Goebel GmbH. Device for controlling the actuation of gripping means in a sheet assembling apparatus. 4,094,499, Cl. 270-60.000.

Thomas, Jeffrey R., to Suntech, Inc. Process for the production of endo-endo hexacyclic dimer of norbornadiene. 4,094,916, Cl. 260-666.00A.

Thomas, Jeffrey R., to Suntech, Inc. Process for the production of exo-exo hexacyclic dimer of norbornadiene. 4,094,917, Cl. 260-666.00A.

Thomas, Robert E.: *See—*
Burke, George K.; LeFevre, Robert J.; and Thomas, Robert E., 4,094,318, Cl. 128-214.00E.

Thomas, Walter Moreland: *See—*
Huffman, Kenneth Robert; Casey, Donald James; and Thomas, Walter Moreland, 4,094,847, Cl. 260-29.40R.

Thompson, Arthur David, to Dobson Park Industries Limited. Bucket loader boom. 4,094,422, Cl. 214-145.00R.

Thompson, Gene D.; and Jahns, Hans O., to Exxon Production Research Company. Offshore structure in frigid environment. 4,094,149, Cl. 61-1.00R.

Thompson, Gerhard Robert: *See—*
Campbell, John Edward; and Thompson, Gerhard Robert, 4,095,283, Cl. 365-230.000.

Thompson, Paul F., to General Cable Corporation. Power cable with improved filling compound. 4,095,039, Cl. 174-23.00C.

Thompson, Thomas D., to Yara Engineering Corporation. Dye or color developing inorganic pigments. 4,094,698, Cl. 106-288.00B.

Thomson-Brandt: *See—*
Romeas, Rene, 4,095,254, Cl. 358-11.000.

Thomson-CSF: *See—*
Athenes, Claude; and Landez, Jean Pierre, 4,095,048, Cl. 178-69.100.
Fontanes, Sylvain, 4,095,219, Cl. 340-347.0NT.
Spitz, Erich; and Bismuth, Guy, 4,094,577, Cl. 350-3.720.
Trotel, Jacques, 4,095,112, Cl. 250-492.00A.

Thor, Gunter: *See—*
Finkensiep, Friedhelm; Meye, Reinhold Walter; and Thor, Gunter, 4,094,946, Cl. 264-171.000.

Thrasher, George E., Jr., to Master Pneumatic-Detroit, Inc. Air line lubricator. 4,094,383, Cl. 184-55.00A.

Thyroid Diagnostics, Inc.: *See—*
Deutsch, Marshall E.; and Mead, Louis W., 4,094,647, Cl. 23-253.0TP.

Tilles, Harry, to Stauffer Chemical Company. Process for preparation of O-(substituted)benzyl thiocarbamates. 4,094,895, Cl. 260-455.00A.

Tilly, Guy; Hardouin, Michel Jean Charles; and Lautrou, Jean, to Laboratoires Andre Guerbet. Iodobenzene derivatives and X-ray contrast media containing the same. 4,094,966, Cl. 424-5.000.

Tion Equipment Company: *See—*
Schueler, Marlin A., 4,094,498, Cl. 270-52.500.

Tirelli, Paolo, to Exo Elettronica Industriale S.r.l. Electronic apparatus for automatic closed loop positioning of mobile members associated with an electromagnetic transducer with two pairs of windings. 4,095,159, Cl. 318-605.000.

Titus, Gerald F.: *See—*
Reeve, Gerome R., 4,095,097, Cl. 250-199.000.

Tixier, Maurice P., to Schlumberger Technology Corporation. Hydrocarbon detection utilizing neutron borehole measurements. 4,095,102, Cl. 250-265.000.

Toal, Desmond J.; McKenzie, John Matthew; and Hemby, Franklin Delano, to International Telephone and Telegraph Corporation. Vehicle wheel trim ring assembly. 4,094,550, Cl. 301-37.00R.

Todtenhaupt, Erich; Muller, Wolfgang; Schupper, Hans; and Geng, Walter, to Ekato-Werk. Apparatus for the continuous thermal sterilization of packing. 4,094,638, Cl. 21-61.000.

Tokico Ltd.: *See—*
Hayashida, Yoshihiro, 4,094,437, Cl. 220-374.000.

Tokyo Electric Co., Ltd.: *See—*
Morimoto, Takao, 4,095,267, Cl. 364-200.000.

Tokyo Jidosha Kogyo Kabushiki Kaisha: *See—*
Goto, Kenji; and Sawada, Daisaku, 4,094,277, Cl. 123-52.0MF.
Sogo, Yoshitaka; and Ida, Shuichiro, 4,094,206, Cl. 74-360.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Aoki, Mitsugu; and Ishihara, Taketoshi, 4,094,592, Cl. 351-30.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Matsumoto, Mitsuo, 4,095,158, Cl. 318-603 000.
Muraoka, Hisashi; and Yoneyama, Teruo, 4,095,095, Cl. 235-419.000.
Yamamoto, Shinichi; Sumitomo, Yasusuke; Horiike, Yasuhiro; and Shibagaki, Masahiro, 4,094,722, Cl. 156-345.000.

Tomiolo, Andrea: *See—*
Torti, Giovanni; and Tomiolo, Andrea, 4,094,117, Cl. 52-698.000.

Tomita, Makoto; Yokota, Hisaaki; Koga, Syozi; and Kashimura, Toshisada, to Kobe Steel, Limited. High efficiency arc welding process and apparatus. 4,095,085, Cl. 219-123.000.

Tomy Kogyo Co., Inc.: *See—*
Sano, Hiroshi, 4,094,089, Cl. 46-1.00K.

Tools for Bending, Inc.: *See—*
Stange, Ronald R.; McGuire, Samuel B.; and Woodring, Thomas W., 4,094,749, Cl. 204-25.000.

Torgersen, G. Earl: *See—*
Pater, Hendrik; Torgersen, G. Earl; and Brunner, Fritz R., 4,094,252, Cl. 104-130.000.

Torley, Jozsef: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,094,908, Cl. 260-570.00R.

Torque Systems, Inc.: *See—*
Febonio, Richard J., 4,095,131, Cl. 310-239.000.

Torti, Giovanni; and Tomiolo, Andrea, to Ing. Giovanni Rodio & C. Impresa Costruzioni Speciali S.p.A. Method and tie bar for the formation of anchorages. 4,094,117, Cl. 52-698.000.

Toshiba Photo Products Co., Ltd.: *See—*
Kuraishi, Kaoru, 4,095,245, Cl. 354-141.000.

Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, to Richter Gedeon Vegyeszeti Gyar Rt. Alpha-substituted benzhydrol derivatives. 4,094,908, Cl. 260-570.00R.

Towa Electric Co., Ltd.: *See—*
Ishido, Yasuhiro, 4,095,174, Cl. 324-52.000.

Towers, Jack E., to Sandoz, Inc. Core form for lining containers. 4,094,491, Cl. 249-83.000.

Toyama, Koichi: *See—*
Okamoto, Atutoshi; Taniguchi, Koichi; Nakano, Yoshiaki; and Toyama, Koichi, 4,094,556, Cl. 303-109.000.

Toyo Kogyo Co., Ltd.: *See—*
Kakui, Kuniaki; Shigeta, Toshihiko; and Koike, Koso, 4,094,618, Cl. 418-178.000.

Toyoda-Koki Kabushiki-Kaisha: *See—*
Hatanaka, Shiro; Tamesui, Tsuyoshi; and Matsuura, Tsuneharu, 4,094,105, Cl. 51-101.00R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hatanaka, Shiro; Tamesui, Tsuyoshi; and Matsuura, Tsuneharu, 4,094,105, Cl. 51-101.00R.
Nohira, Hidetaka, 4,094,287, Cl. 123-119.00A.

Trail Manufacturing Ltd.: *See—*
Lee, Arthur, 4,094,382, Cl. 184-15.00R.

Tram/Diamond Corporation: *See—*
O'Callaghan, James S., 4,094,485, Cl. 248-221.300.

Trans World Technology Laboratories, Inc.: *See—*
Habib, David P.; and Zweig, Gilbert, 4,094,681, Cl. 96-49.000.

Traut, Earl W. V-Groove rolling contact roller bearing. 4,094,560, Cl. 308-206.000.

Travor, Bruce W., to United States of America, Army. Fluid stabilizing insert for projectiles. 4,094,246, Cl. 102-66.000.

Treiber, Helmut: *See—*
Payrhammer, Bernd; and Treiber, Helmut, 4,094,604, Cl. 355-68.000.

Trepanier, Donald L.; and Britton, Thomas C., to Dow Chemical Company, The. 1,3,4-Benzotriazepine-2-thiones. 4,094,871, Cl. 260-239.30B.

Tridon Limited: *See—*
Waterman, Peter G.; and Emmons, Donald Earl, 4,094,039, Cl. 15-250.320.

Triplex Safety Glass Company Limited: *See—*
Nixon, Phillip Sydney; and Woods, Harold, 4,094,659, Cl. 65-104.000.

Trommet, Alfred: *See—*
Liberda, Heinz; Spes, Hellmuth; and Trommet, Alfred, 4,094,902, Cl. 260-551.00P.

Trotel, Jacques, to Thomson-CSF. Device for and a method of calibrating electron-optical apparatus. 4,095,112, Cl. 250-492.00A.

Trotta, Robert Anthony, to Gillette Company, The. Razor assembly with pivotally mounted cartridge. 4,094,063, Cl. 30-47.000.

True Temper Corporation: *See—*
Carter, Larry D., 4,095,231, Cl. 343-846.000.

TRW Inc.: *See—*
Birmingham, Douglas William, 4,094,436, Cl. 220-315.000.
Clark, George L., 4,095,193, Cl. 331-94.50G.
Hayden, Rodney, 4,095,213, Cl. 340-252.00R.
Updike, Stanley H., 4,094,280, Cl. 123-90.300.

TRW Valves Limited: *See—*
Naul, Frederick Henry, 4,094,107, Cl. 51-215.0CP.

Tsao, Utah, to Lummus Company, The. Recovery of 12-dichloroethane from vinyl chloride production effluent. 4,094,915, Cl. 260-656.00R.

Tschentscher, Alfred, to FMN Schuster & Co. Device for feeding thread into a traversing device in a winding machine. 4,094,471, Cl. 242-18.0PW.

Tsekhanovskaya, Nina Alexandrovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,095,032, Cl. 526-11.100.

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Yokoyama, Tsuneo; Yajima, Toshiyuki; Tsuchiya, Kazumichi; and Takemae, Hisao, 4,095,244, Cl. 354-82.000.

Tsuji, Sadahiko: *See—*
Sato, Yasuhisa; Tsuji, Sadahiko; and Tanaka, Katsumi, 4,094,586, Cl. 350-184.000.

Tsujino, Nobuyuki; Ogawa, Akira; Shishido, Tadao; and Adachi, Keii-

chi, to Fuji Photo Film Co., Ltd. Direct positive silver halide photographic materials. 4,094,683, Cl. 96-95.000.
Tsumori, Akihiro; and Shima, Kenji, to Mitsubishi Denki Kabushiki Kaisha. Protective device for induction heating apparatus. 4,095,076, Cl. 219-10.49R.
Tsunekawa, Tokuichi; Uchidoi, Masanori; Nakamura, Zenzo; Taguchi, Tetsuya; Aizawa, Hiroshi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Matching device for flash light photographic device. 4,095,242, Cl. 354-33.000.
Tsuru, Shinobu: *See—*
Oyamada, Takeo; Satoh, Kazuhisa; Tsuru, Shinobu; Domoto, Masahiro; and Narisawa, Shizuo, 4,094,849, Cl. 260-29.6MQ.
Tsutsui, Takayuki, to Xerox Corporation. Exhaust system for pyrographic printer. 4,095,240, Cl. 346-163.000.
Tsutsumi, Shigeru. Toggle means. 4,094,208, Cl. 74-520.000.
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Cook, Toby M.; Tucker, Gerald L.; and Brown, Marion L., 4,094,643, Cl. 23-285.000.
Tucker, Robert Clark, Jr.: *See—*
Weatherly, Merle Howard; and Tucker, Robert Clark, Jr., 4,095,003, Cl. 427-34.000.
Tuckey, Charles H.; and Tuckey, Roy J., to Tuckey Corporation. Horizontal updraft carburetor. 4,094,934, Cl. 261-64.00R.
Tuckey Corporation: *See—*
Tuckey, Charles H.; and Tuckey, Roy J., 4,094,934, Cl. 261-64.00R.
Tuckey, Roy J.: *See—*
Tuckey, Charles H.; and Tuckey, Roy J., 4,094,934, Cl. 261-64.00R.
Tullius, Karl: *See—*
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Tuma, Alois Vaclav: *See—*
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Tummes, Hans: *See—*
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Turner, James Franklin, to Combustion Engineering, Inc. Welding flux curing apparatus. 4,094,630, Cl. 432-134.000.
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Ueyama, Fumio; and Yoshimitsu, Takao, to Osaka Denki Co., Ltd. Method for measuring the extent of shielding function of an arc atmosphere and an arc welding machine including a nitrogen oxide measuring device measuring the extent of shielding function. 4,095,080, Cl. 219-74.000.
Ulbricht, Wolfgang: *See—*
Leisner, Ernst; Ulbricht, Wolfgang; and Kaufmann, Helmut, 4,094,339, Cl. 137-604.000.
Ullmann, Werner; Fricker, Paul; and Guenin, Maurice, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Tool holder for a spark erosion machine tool. 4,095,079, Cl. 219-69.00E.
Umemoto, Takashi: *See—*
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Umezawa, Norio: *See—*
Shibata, Nobuho; Seri, Tutomu; Umezawa, Norio; and Morofuji, Takeshi, 4,095,166, Cl. 323-17.000.
Unarco Industries, Inc.: *See—*
Davis, Cecil E., 4,094,525, Cl. 280-11.200.
Union Carbide Corporation: *See—*
Denny, Arthur Francis; Gioffre, Anthony Joseph; and Sherman, John Delano, 4,094,778, Cl. 210-38.00A.
Weatherly, Merle Howard; and Tucker, Robert Clark, Jr., 4,095,003, Cl. 427-34.000.
Union Oil Company of California: *See—*
Mickelson, Grant A., 4,094,820, Cl. 252-465.000.
Union Special Corporation: *See—*
Fletcher, Roy W.; Volkmann, Robert W.; and Forte, Anthony D., 4,094,259, Cl. 112-110.000.
Union Special G.m.b.H.: *See—*
Kleinschmidt, Johann Otto; and Niem, Wolfgang, 4,094,260, Cl. 112-121.150.
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Ferrell, Wesley; and Shichman, Daniel, 4,094,354, Cl. 152-361.00R.
United Kingdom Atomic Energy Authority: *See—*
Clelland, David Watson, 4,094,762, Cl. 204-192.0EC.
Madsen, Peter Emil; Charlesworth, John Philip; and Armstrong, Derek, 4,094,060, Cl. 29-599.000.
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Bates, Leslie Raymond; and Jenkins, John Michael, 4,094,879, Cl. 260-299.000.
United States Borax & Chemical Corporation: *See—*
Shen, Kelvin Kei-Wei; and Belles, Wayne Stuart, 4,094,662, Cl. 71-92.000.
Shen, Kelvin Kei-Wei, 4,094,663, Cl. 71-92.000.
United States Gypsum Company: *See—*
Long, William J., 4,094,694, Cl. 106-111.000.
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Agriculture: *See—*
Schneider, Wilma J.; and Gast, Lyle E., 4,094,838, Cl. 260-22.0TN.
Air Force: *See—*
Rahilly, W. Patrick, 4,094,730, Cl. 156-606.000.
Army: *See—*
Atkinson, Edward E.; and Queen, William E., 4,095,192, Cl. 331-78.000.
Homko, Joseph C., 4,094,224, Cl. 86-31.000.
Jacobson, Sidney S., 4,094,248, Cl. 102-100.000.
Matura, Joseph R., 4,094,245, Cl. 102-35.000.
Ng, Wahling H.; and Zaycer, Andrew, 4,094,520, Cl. 277-166.000.
Schmidlin, Albertus E., 4,094,247, Cl. 102-228.000.
Terranova, A. P.; and Murphy, F. J., 4,095,145, Cl. 315-383.000.
Travor, Bruce W., 4,094,246, Cl. 102-66.000.
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Beeman, Raymond; and Brajkovich, Steven J., 4,094,492, Cl. 251-212.000.
Begley, Richard F.; and Kurnit, Norman A., 4,095,121, Cl. 307-88.300.
Ross, Wayne A., 4,094,809, Cl. 252-301.10W.
Schieber, Michael M.; Beinglass, Israel; and Dishon, Giora, 4,094,268, Cl. 118-49.100.
Wallace, Steven A., 4,095,106, Cl. 250-358.00R.
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Bauer, Donald J.; Eisele, Judith A.; and Eichbaum, Barlane R., 4,094,955, Cl. 423-123.000.
LeVere, Richard W.; Vocaturo, Joseph M.; and Finney, James L., 4,094,158, Cl. 61-63.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Howarth, John T.; Sheth, Suresh; Sidman, Kenneth R.; and Massucco, Arthur A. Process for spinning flame retardant elastomeric compositions. 4,094,943, Cl. 264-130.000.
Sadhukhan, Pasupati; and Bell, Alexis T. Process for preparing higher oxides of the alkali and alkaline earth metals. 4,094,758, Cl. 204-164.000.
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Bell, Vernon L., 4,094,862, Cl. 260-65.000.
Parra, Gilbert T., 4,094,073, Cl. 33-366.000.
Navy: *See—*
Boyars, Carl; and Kamlet, Mortimer J., 4,094,710, Cl. 149-3.000.
Breslow, B. Arthur, 4,094,713, Cl. 149-36.000.
Howard, Dean D., 4,095,223, Cl. 343-7.900.
Kaloi, Cyril M., 4,095,227, Cl. 343-700.0MS.
U.S. Philips Corporation: *See—*
Hoeberechts, Arthur Marie Eugene, 4,095,133, Cl. 313-336.000.
LePoole, Jan Bart; and van der Mast, Karel Diederick, 4,095,104, Cl. 250-311.000.
Mulder, Rudolf; and Wellinga, Kobus, 4,095,026, Cl. 548-379.000.
Rabuffetti, Sergio, 4,094,702, Cl. 134-10.000.
Strik, Francis Bernardus, 4,095,134, Cl. 313-470.000.
Vahe, Jacques, 4,094,752, Cl. 204-129.950.
van Ass, Henricus Matheus Jacobus Marie; and Gossink, Robert Georg, 4,094,689, Cl. 106-50.000.
Verkroost, Gerard; and Butterweck, Hans-Jurgen, 4,095,276, Cl. 364-724.000.
United States Steel Corporation: *See—*
Masciantonio, Philip X.; and Schowalter, Kenneth A., 4,094,746, Cl. 201-5.000.
United States Trading International, Inc.: *See—*
De Long, Charles F., 4,094,845, Cl. 260-29.4UA.
United Technologies Corporation: *See—*
Goetsch, Henry E.; and Mercik, Henry J., Jr., 4,094,191, Cl. 73-118.000.
Mendelsohn, Charles, 4,095,144, Cl. 315-375.000.
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Milo, Joseph V., 4,094,346, Cl. 141-286.000.
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Castaigne, Francois; Boulet, Marcel; Riel, Rene R.; and Liber, Eric, 4,094,235, Cl. 99-450.100.
UOP Inc.: *See—*
Bailey, Charles H., 4,094,645, Cl. 23-288.0FC.
Lemberger, Earl S.; Olson, Robert K.; and Smith, Lester F., 4,094,814, Cl. 252-415.000.
Olson, Robert K.; and Smith, Lester F., 4,094,817, Cl. 252-415.000.
Wagner, Melvin H., 4,094,644, Cl. 23-288.00F.
Updike, Stanley H., to TRW Inc. Valve rotating device. 4,094,280, Cl. 123-90.300.
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Upjohn Company, The: *See—*
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Kaugars, Girts, 4,094,906, Cl. 260-566.00B.
Kelly, Robert C., 4,094,882, Cl. 260-343.000.
Kelly, Robert C., 4,094,883, Cl. 260-343.600.
Kelly, Robert C., 4,094,884, Cl. 260-343.600.
Morton, Douglas Ross, Jr., 4,094,891, Cl. 260-413.000.
Onder, Besir K., 4,094,864, Cl. 260-78.0TF.
Onder, Besir K., 4,094,866, Cl. 260-78.00R.

Salmond, William G., 4,094,890, Cl. 260-397.200.
Yankee, Ernest W., 4,095,036, Cl. 560-121.000.

Urbin, Matthew C. Stopper for test tube, and the like. 4,094,429, Cl. 215-305.000.

Urschel, Fred P.: *See—*
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Urschel, John N.; Urschel, Robert P.; and Urschel, Fred P. Back draft for exhaust fans and hoods. 4,094,336, Cl. 137-512.100.

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USM Corporation: *See—*
Hold, Peter, 4,094,940, Cl. 264-40.600.

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Kutscher, Horst; and Zahs, Gernot, 4,094,495, Cl. 266-143.000.

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Vahe, Jacques, to U.S. Philips Corporation. Method of manufacturing opto-electronic devices. 4,094,752, Cl. 204-129.950.

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Valancius, James P., to Addressograph-Multigraph Corporation. Method of fixing a toner powder image on a sheet of material. 4,094,674, Cl. 96-1.0SD.

Valleylab, Inc.: *See—*
Newton, David W.; and Alford, Frank A., 4,094,320, Cl. 128-303.140.

Valtsov, Vladimir Viktorovich: *See—*
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van Ass, Henricus Matheus Jacobus Marie; and Gossink, Robert Georg, to U.S. Philips Corporation. Glass compositions. 4,094,689, Cl. 106-50.000.

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van der Mast, Karel Diederick: *See—*
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Van Eecke, Roger H.: *See—*
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Van Schoiack, Michael M.: *See—*
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Vansteelant, Marc G.: *See—*
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Varian Associates, Inc.: *See—*
Hlavka, Lloyd F., 4,095,168, Cl. 324-0.5AH.
Niklas, Wilfrid F., 4,095,136, Cl. 315-11.000.

Varma, Ravi K., to E. R. Squibb & Sons, Inc. 17-Alkylthio (and arylthio) androsteno[16α,17α-b]benzodioxin-3-ones. 4,094,840, Cl. 260-239.55R.

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Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
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Vernon, Eugene G. Interlocking two piece hull for a catamaran. 4,094,027, Cl. 9-6.00P.

Vernon, Lonnie W.: *See—*
Koh, Kwang K.; Nahas, Nicholas C.; Pennington, Robert E.; and Vernon, Lonnie W., 4,094,650, Cl. 48-197.00R.

Vesel, Andrew M., to Cessna Aircraft Company, The. Variable phase shifter. 4,095,186, Cl. 328-133.000.

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Reimert, Larry E., 4,094,539, Cl. 285-309.000.

Victor Company of Japan, Limited: *See—*
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Vigluicci, Kenneth: *See—*
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Vinals, Joaquin: *See—*
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Vladuchick, Susan Anne, to Du Pont de Nemours, E. I., and Company. Fungicidal isothiazoles. 4,094,985, Cl. 424-270.000.

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Vock, Manfred Hugo: *See—*
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Vogel, Charles A., to Fedders Corporation. Apparatus for imparting independent rotational and translational movement. 4,094,426, Cl. 214-338.000.

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Volle, Gunter, to Schlafer G.m.b.H. & Co. Hand shower. 4,094,468, Cl. 239-394.000.

Von den Hoff, Johan P. H., to Stamicarbon, B.V. Process for the decarboxylation-oxidation of benzoic acid compounds. 4,094,909, Cl. 206-586.00P.

von der Eltz, Hans-Ulrich, to Hoechst Aktiengesellschaft. Process for dyeing cellulose fibers with water-insoluble azo dyestuffs produced on the fiber. 4,094,636, Cl. 8-46.000.

von der Heyden, Horst: *See—*
Blum, Arnold; von der Heyden, Horst; Irro, Fritz; Knauft, Guenter; Richter, Stephan; and Schulze-Schoelling, Hermann, 4,095,270, Cl. 364-200.000.

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von Pieverling, Klaus; Sepp, Hermann; and Baier, Walter, to Siemens Aktiengesellschaft. Phase regulating circuit. 4,095,047, Cl. 178-69.100.

Vorwerk & Co. Interholding GmbH: *See—*
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Vrba, Richard Alan, to International Business Machines Corporation. Memory control structure for a pipelined mini-processor system. 4,095,265, Cl. 364-200.000.

Vulcano, Vincent N.; and Friedman, Maurice W., to Friedman, Maurice W. Automatic bagging machine. 4,094,128, Cl. 53-52.000.

W. R. Grace & Co.: *See—*
Hartdegen, Frank Joseph; and Swann, Wayne Elliott, 4,094,744, Cl. 195-63.000.
Lowther, Frank Eugene, 4,094,652, Cl. 55-33.000.
Schirmer, Henry G., 4,095,012, Cl. 428-474.000.

W. Vinten Limited: *See—*
Galione, Edward Richard David, 4,094,484, Cl. 248-162.000.

Wacker-Chemie GmbH: *See—*
Liberda, Heinz; Spes, Hellmuth; and Trommet, Alfred, 4,094,902, Cl. 260-551.00P.

Waenerlund, Lars; and Boback, Torsten, to Munkedals Aktiebolag. Packing wire cutting device. 4,095,078, Cl. 219-68.000.

Wagner Electric Corporation: *See—*
Falk, Edward J., 4,094,388, Cl. 188-71.900.

Wagner, Erwin O.: *See—*
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Wagner, Melvin H., to UOP Inc. Catalytic exhaust muffler for motorcycles. 4,094,644, Cl. 23-288.00F.

Wagner, William T., to Dayco Corporation. Loom picker construction. 4,094,341, Cl. 139-159.000.

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Waldhofer, Reinhard, to Krupp-Koppers GmbH. Comminutor for use in a gasifying installation. 4,094,470, Cl. 241-46.00R.

Walker, David Baird Langley: *See—*
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Walker, Dean M.: *See*—
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Walker, George R.: *See*—
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Walker, Wesley M.; Walker, Robert W.; and Walker, Dean M., 4,094,935, Cl. 261-80.000.
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Wall, Arne Evert: *See*—
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Wallace, Steven A., to United States of America, Energy. Radiation attenuation gauge with magnetically coupled source. 4,095,106, Cl. 250-358.00R.
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Nangle, Bernard; McGaha, Patrick L.; Wallace, Thomas J.; and Anderson, Todd B., 4,095,119, Cl. 290-40.00R.
Walmer, Harry E. Doll house. 4,094,090, Cl. 46-19.000.
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Warne, Thomas M., to Standard Oil Company (Indiana). Anti-wear lubricating oil compositions. 4,094,800, Cl. 252-32.70E.
Warren, Daniel Davis. Stamp dispensing apparatus. 4,094,441, Cl. 221-18.000.
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Johnson, Richard C., 4,094,988, Cl. 424-277.000.
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Wasnich, Richard D. Nebulization system. 4,094,317, Cl. 128-194.000.
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Waterman, Peter G.; and Emmons, Donald Earl, to Tridon Limited. Windshield wiper bayonet clip with double latch. 4,094,039, Cl. 15-250.320.
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Friswell, David R.; and Finn, Lawrence J., 4,094,195, Cl. 73-422.0GC.
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Weaver, Elbert K., to Wyman-Gordon Company. Forging process. 4,094,053, Cl. 29-420.000.
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Weiler, Ernest D., to Rohm and Haas Company. 3-Pyridylmethyl N-(4-cyanomethylphenyl)carbamate and derivatives. 4,094,875, Cl. 260-270.0PY.
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Welke, Helmut; and Tullius, Karl, to Klockner-Humboldt-Deutz Aktiengesellschaft. Detachable ballast vehicle stabilizer. 4,094,534, Cl. 280-760.000.
Wellekens, John F. Tamper-resistant lock and key assembly. 4,094,177, Cl. 70-423.000.
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Wendler, Norman L.; Girotra, Narindar N.; and Zelawski, Zbigniew S., deceased (by Zelawski, Maria W., administrator), to Merck & Co., Inc. Chemical synthesis of flavipucine. 4,094,878, Cl. 260-297.00Z.
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Wescoat, George F., to Granite State Machine Co., Inc. Lottery ticket dispenser for break-resistant web material. 4,094,451, Cl. 225-96.000.
Wessel, Wolf, to Robert Bosch GmbH. Mixture control monitor apparatus. 4,094,186, Cl. 73-1.00G.
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Westberg, Torsten Boris Joel. Method in destructing chills and a device for carrying out the method. 4,094,181, Cl. 72-325.000.
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Bauerle, James E.; Reed, William H.; and Berkey, Edgar, 4,095,171, Cl. 324-33.000.
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Cookson, Alan H., 4,095,040, Cl. 174-28.000.
Fluet, Francis A., 4,095,275, Cl. 364-721.000.
Gallagher, Robert C., 4,094,733, Cl. 156-648.000.
Gupta, Tapan K.; and Straub, William D., 4,094,061, Cl. 29-612.000.
Matty, Thomas C.; and Franz, James H., Jr., 4,095,153, Cl. 318-376.000.
Meyer, Jeffry R.; and Hess, Robert L., 4,095,068, Cl. 200-144.0AP.
Moeglich, Karl, 4,094,755, Cl. 204-149.000.
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Oehler, Harry G., 4,095,282, Cl. 365-204.000.
Schneider, Urban A.; and Sigman, Robert D., 4,095,077, Cl. 219-61.000.
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Simms, Robert A.; and Feaster, Gene R., 4,094,563, Cl. 316-19.000.
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Wheeler, William A. Paint tray with brush holding attachment. 4,094,431, Cl. 220-23.400.
Whelan, James P., to Ad-Tec Products, Inc. Paint strainer dispenser. 4,094,443, Cl. 221-63.000.
White, Bruce Lynn; Kiner, Mark Winfield; and Wiens, Arlen Jacob, to Hesston Corporation. Method for loading and disintegrating single round bales. 4,094,427, Cl. 214-505.000.
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Whitlock, David W., to Federation of Fly Fishermen. Fish egg incubating device. 4,094,270, Cl. 119-3.000.
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Whyte, Francis. Walking boot for surgical leg cast. 4,094,312, Cl. 128-83.500.
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Wilhelmsen, Irven R. Truck body door assembly. 4,094,562, Cl. 312-290.000.
Wilkerson, Darrell F. Aerial extension ladder. 4,094,381, Cl. 182-67.000.
Wilkins, John Thomas; and Mayo, Haydn Frank, to R. G. Dixon & Company Limited. Floor treatment machines. 4,094,034, Cl. 15-49.00R.
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Wirtz, Egon; and Berghaus, Klaus, to Keiper KG. Knob for seat-angle adjuster of motor-vehicle seat. 4,094,210, Cl. 74-553.000.
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Wolf, Franz-Josef. Method and molding core for making a flexible hollow molded body which is open on a number of sides. 4,094,688, Cl. 106-38.200.
Wolf, Robert H. Tree and stump splitter. 4,094,348, Cl. 144-34.00F.
Wolfe, James Richard, Jr., to Du Pont de Nemours, E. I., and Company. Copolymerizable phenolic antioxidant. 4,094,857, Cl. 260-45.9QB.
Wolff, Douglas F.; Minick, Harold N.; and Reinhart, Jay J., to Harter Corporation. Wiring enclosure for desks. 4,094,561, Cl. 312-223.000.
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Wormser, Robert S. Playground swing with extruded crossbar. 4,094,503, Cl. 272-85.000.
Wright, George C.; and Goldenberg, Marvin M., to Morton-Norwich Products, Inc. 6-Methoxy-N-vanillylidene-4-chromanamine. 4,095,023, Cl. 542-422.000.
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Yoshimura, Noboru, to Aisin Seiki Kabushiki Kaisha. Seat position adjusting means for automobile seat assemblies. 4,094,489, Cl. 248-429.000.
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Zietzschmann, Jurgen, to Mead Corporation, The. Package for a group of articles. 4,094,406, Cl. 206-432.000.
Zilbert, Seymour. Industrial drums. 4,094,432, Cl. 220-63.00R.
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Colchagoff, Robert D.; Fortner, Paul W.; Kirkman, Richard T.; Naughton, Thomas J.; and Zimmerman, George, 4,094,656, Cl. 65-81.000.
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Malinovski, Yordan Petrov; Bakardjiev, Stefan Todorov; and Martinov, Georgi Mirchev, 4,094,269, Cl. 118-49.100.
Zollinger, Hans Rudolf, to Schlatter AG. Apparatus for welding electrical contacts. 4,095,082, Cl. 219-78.150.
Zollinger, Joseph La Mar: *See—*
Mitsch, Ronald A.; and Zollinger, Joseph La Mar, 4,094,911, Cl. 260-615.00A.
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Zuech, Ernest A.: *See—*
Murtha, Timothy P.; and Zuech, Ernest A., 4,094,918, Cl. 260-668.00R.
Murtha, Timothy P.; and Zuech, Ernest A., 4,094,920, Cl. 260-668.00R.
Zukowski, Edward August: *See—*
Carrock, Frederick Elias; Perron, Peter James; and Zukowski, Edward August, 4,095,016, Cl. 526-137.000.
Zumbach, Bruno, to Zumbach Electronic AG. Apparatus for producing identical sheets of material having a number of representations thereon. 4,094,605, Cl. 355-95.000.
Zumbach Electronic AG: *See—*
Zumbach, Bruno, 4,094,605, Cl. 355-95.000.
Zurn Industries, Inc.: *See—*
Bodick, Gaylord E.; and Gruber, Martin V., 4,094,937, Cl. 261-111.000.
Zweig, Gilbert: *See—*
Habib, David P.; and Zweig, Gilbert, 4,094,681, Cl. 96-49.000.

LIST OF REISSUE PATENTEES

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AMP Incorporated: *See—*
Reynolds, Charles Edward; and Swartz, John Clinton, Re. 29,666, Cl. 339-15.000.

Eastman Kodak Company: *See—*
Spaulding, Richard A., Re. 29,670, Cl. 358-4.000.

Gusmer Corporation: *See—*
Gusmer, Frederick E.; Sundberg, Carl W., Jr.; and Hayes, Joseph E., Jr., Re. 29,665, Cl. 239-112.000.

Gusmer, Frederick E.; Sundberg, Carl W., Jr.; and Hayes, Joseph E., Jr., to Gusmer Corporation. Apparatus for ejecting a mixture of a plurality of liquids. Re. 29,665, Cl. 239-112.000.

Harner, Kermit I., to United Technologies Corporation. Compressor surge sensor. Re. 29,667, Cl. 415-28.000.

Hayes, Joseph E., Jr.: *See—*
Gusmer, Frederick E.; Sundberg, Carl W., Jr.; and Hayes, Joseph E., Jr., Re. 29,665, Cl. 239-112.000.

Kansas Jack, Inc.: *See—*
Kuhn, Charles Joseph, Re. 29,664, Cl. 72-444.000.

Kuhn, Charles Joseph, to Kansas Jack, Inc. Hydraulic pulley apparatus. Re. 29,664, Cl. 72-444.000.

Lombardino, Joseph G., to Pfizer Inc. Glycineamides. Re. 29,668, Cl. 260-306.80R.

Lombardino, Joseph G., to Pfizer, Inc. Production of 4-hydroxy-1,2-benzothiazine-3-carboxamides. Re. 29,669, Cl. 544-49.000.

Pfizer Inc.: *See—*
Lombardino, Joseph G., Re. 29,668, Cl. 260-306.80R.
Lombardino, Joseph G., Re. 29,669, Cl. 544-49.000.

Reynolds, Charles Edward; and Swartz, John Clinton, to AMP Incorporated. Electrical contact terminal having improved wire-receiving slot. Re. 29,666, Cl. 339-15.000.

Spaulding, Richard A., to Eastman Kodak Company. Multi-color acoustooptic modulator. Re. 29,670, Cl. 358-4.000.

Sundberg, Carl W., Jr.: *See—*
Gusmer, Frederick E.; Sundberg, Carl W., Jr.; and Hayes, Joseph E., Jr., Re. 29,665, Cl. 239-112.000.

Swartz, John Clinton: *See—*
Reynolds, Charles Edward; and Swartz, John Clinton, Re. 29,666, Cl. 339-15.000.

United Technologies Corporation: *See—*
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Kinney, Charles Lyle. Pear tree. 4,263, 6-13-78, Cl. 36.000.

Mikkelsen, James C., to Mikkelsens Inc. Impatiens plant. 4,262, 6-13-78, Cl. 68.000.

Mikkelsens Inc.: *See—*
Mikkelsen, James C., 4,262, Cl. 68.000.

Saville, F. Harmon: *See—*
Schwartz, Ernest, 4,264, Cl. 9.000.
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Schwartz, Ernest, to Saville, F. Harmon. Rose plant. 4,264, 6-13-78, Cl. 9.000.

Schwartz, Ernest, to Saville, F. Harmon. Rose plant. 4,265, 6-13-78, Cl. 8.000.

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Acrylic Designs, Inc.: *See—*
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American Locker Security Systems, Inc.: *See—*
Stackhouse, Wells F.; and Barth, Douglas A., 248,138, Cl. D6-170.000.

Anderson, Victor F., to Shell Oil Company. Shoe. 248,126, 6-13-78, Cl. D2-292.000.

Appelblom, Harold R., deceased: *See—*
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Yoshida, Saburo; Appelblom, Harold R., deceased; and Appelblom, Mae H., administratrix, 248,153, Cl. D11-152.000.

Aulbert, Harold V., to Vaughan Furniture Company, Incorporated. Dresser or similar article. 248,136, 6-13-78, Cl. D6-154.000.

Bamis Manufacturing Company: *See—*
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Batra, Vijay. Outer sole for footwear. 248,127, 6-13-78, Cl. D2-320.000.

Bell, Mace Hudson; and Haas, David Lee. Sphygmomanometer. 248,164, 6-13-78, Cl. D24-21.000.

Berkline Corporation, The: *See—*
Long, Stapleton, 248,129, Cl. D6-37.000.
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Cannon, Thomas G.; and Mackay, Spencer L., to Teledyne Industries. Serving spoon. 248,143, 6-13-78, Cl. D7-140.000.

Carolina Enterprises, Inc.: *See—*
Hastings, Hank, 248,152, Cl. D10-120.000.

Carrier, Raymond E. Golf putter head. 248,180, 6-13-78, Cl. D34-5.0GH.

Cavanaugh, Genevieve S., to Cavanaugh, Genevieve S. Fire lighter. 248,162, 6-13-78, Cl. D23-166.000.

Cervantes, Walter I. Golf putter head. 248,181, 6-13-78, Cl. D34-5.0GH.

Chamberlin, Davis W., to Minnesota Mining and Manufacturing Company. Developer powder container. 248,148, 6-13-78, Cl. D9-224.000.

Comfort, Barbara; and von Roth, Frederik George Richard, to Acrylic Designs, Inc. Accessory holder for food processors. 248,140, 6-13-78, Cl. D6-181.000.

Corning Glass Works: *See—*
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Dalzell, Charles J. Combined solid fuel unit and igniter. 248,161, 6-13-78, Cl. D23-166.000.

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Drag, Gerard, to General Binding Corporation. Book support bracket. 248,146, 6-13-78, Cl. D8-363.000.

Duris, Rudolph M., to General Signal Corporation. Electric buzzer. 248,151, 6-13-78, Cl. D10-116.000.

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Feinbloom, Richard E.; and Endrodi, Laszlo, 248,160, Cl. D16-38.000.

Eshelman, Cheston Lee. Electric car. 248,155, 6-13-78, Cl. D12-92.000.

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Feinbloom, Richard E.; and Endrodi, Laszlo, to Designs for Vision, Inc. Photo adapter microscope accessory. 248,160, 6-13-78, Cl. D16-38.000.

Forsland, Audre C. Pillow. 248,141, 6-13-78, Cl. D6-201.000.

Fujita, Teizo; and Ohashi, Toshiro, to Izumi Denki Company Limited. Motor timer. 248,149, 6-13-78, Cl. D10-40.000.
Ganzi, Gary C.; O'Donoghue, Kenneth; and Jha, Anil D., to Ionics, Inc. Electrode frame for use in an electrolytic filter press cell apparatus or the like. 248,157, 6-13-78, Cl. D13-40.000.
Garcia, John Anthony Mason. Candle holder. 248,182, 6-13-78, Cl. D48-2.000.
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Greger, Richard W., to Corning Glass Works. Browning griddle or the like for microwave ovens. 248,142, 6-13-78, Cl. D7-87.000.
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Bell, Mace Hudson; and Haas, David Lee, 248,164, Cl. D24-21.000.
Hastings, Hank, to Carolina Enterprises, Inc. Siren. 248,152, 6-13-78, Cl. D10-120.000.
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Kelly, Gordon, to Bamis Manufacturing Company. Male urinal. 248,168, 6-13-78, Cl. D24-54.000.
Keyawa, Stanley J. Detachable multi-purpose light platform. 248,185, 6-13-78, Cl. D48-4.00A.
Koch, Samuel J. Combined moisture and light meter for plants. 248,150, 6-13-78, Cl. D10-56.000.
Kreitz, Lloyd D. Multi-purpose jig for use with table saws. 248,144, 6-13-78, Cl. D8-14.000.
Long, Stapleton, to Berkline Corporation, The. Lounge chair. 248,129, 6-13-78, Cl. D6-37.000.
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Roberts, Thomas Peter. Lamp for illuminating door locks and the like. 248,184, 6-13-78, Cl. D48-4.00B.
Roberts, Wallace A. Skin care equipment and stand apparatus. 248,163, 6-13-78, Cl. D24-1.100.
Roe, George J. Bagpipe practice chanter. 248,187, 6-13-78, Cl. D56-1.00C.
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Yamamoto, Shinji, to Matsushita Electric Works, Ltd. Hair dryer. 248,169, 6-13-78, Cl. D28-13.000.
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118 4,094,191
133 R 4,094,192
170 A 4,094,193
194 VS 4,094,194
422 OC 4,094,195
4,094,196
423 A 4,094,197
460 4,094,198
517 B 4,094,199

CLASS 74

5 R 4,094,200
56 4,094,201
60 4,094,202
230.17 E 4,094,204
230.17 F 4,094,203
242.1 FP 4,094,205
360 4,094,206
425 4,094,207
520 4,094,208
543 4,094,209
553 4,094,210
868 4,094,211

CLASS 75

11 4,094,665
58 4,094,666
92 4,094,667
99 4,094,668
108 4,094,669
124 4,094,670
157.5 4,094,671
226 4,094,672
246 4,094,673

CLASS 81

3.8 4,094,212
9.5 R 4,094,213
4,094,214
127 4,094,215
156 4,094,216

CLASS 83

6 4,094,217
62.1 4,094,218
345 4,094,219
712 4,094,220
762 4,094,221

CLASS 85

63 4,094,222

CLASS 86

31 4,094,224

CLASS 89

41 L 4,094,225

CLASS 91

39 4,094,226
180 4,094,227
411 B 4,094,228
506 4,094,229

CLASS 92

51 4,094,230
128 4,094,231

CLASS 96

1 SD 4,094,674
1.5 4,094,675
36 4,094,677
36.1 4,094,678
36.3 4,094,679
41 4,094,680
49 4,094,681
55 4,094,682
90 R 4,094,676
95 4,094,683
108 4,094,684

CLASS 98

36 4,094,232

CLASS 99

305 4,094,233
310 4,094,234
450.1 4,094,235
450.4 4,094,236
451 4,094,237
643 4,094,238

CLASS 100

5 4,094,239
97 4,094,240

CLASS 101

66 4,094,244
120 4,094,241
123 4,094,242
349 4,094,243

CLASS 102

35 4,094,245
66 4,094,246
100 4,094,248
228 4,094,247

CLASS 104

6 4,094,249
12 4,094,250
4,094,251
130 4,094,252

CLASS 105

225 4,094,253
282 P 4,094,254

CLASS 106

13 4,094,686
21 4,094,687
38.2 4,094,688
50 4,094,689
73.4 4,094,690
95 4,094,691
104 4,094,692
111 4,094,693
4,094,694
179 4,094,695
277 4,094,696
280 4,094,697
288 B 4,094,698
288 Q 4,094,699

CLASS 108

25 4,094,255
50 4,094,256
115 4,094,257

CLASS 112

20 4,094,258
110 4,094,259
121.15 4,094,260
228 4,094,261

CLASS 114

43 4,094,262
91 4,094,263
304 4,094,264
307 4,094,265

CLASS 116

64 4,094,266
124 B 4,094,267

CLASS 118

49.1 4,094,268
4,094,269

CLASS 119

3 4,094,270
5 4,094,271

CLASS 123

30 D 4,094,272
32 EE 4,094,273
32 EL 4,094,274
34 A 4,094,275
52 M 4,094,276
52 MF 4,094,277
59 EC 4,094,278
90.3 4,094,280
90.51 4,094,279
98 4,094,281
117 A 4,094,282
119 A 4,094,283
4,094,284
4,094,285
4,094,286
4,094,287
127 4,094,288
141 4,094,289
4,094,290
4,094,291
179 G 4,094,292
196 S 4,094,293

CLASS 124

56 4,094,294

CLASS 126

25 R 4,094,295
30 4,094,296
39 J 4,094,297
263 4,094,298
270 4,094,299
271 4,094,300
4,094,301
400 4,094,302

CLASS 127

24 4,094,700

CLASS 128

1 R 4,094,303
2 E 4,094,305
2 V 4,094,304
4,094,306
2.05 R 4,094,308
2.06 E 4,094,309
2.06 G 4,094,310
2.1 B 4,094,307
66 4,094,311
83.5 4,094,312
130 4,094,313
142.2 4,094,314
152 4,094,315
156 4,094,316
194 4,094,317
214 E 4,094,318
284 4,094,319
294 4,094,020
303.14 4,094,320
419 N 4,094,322
419 P 4,094,321

CLASS 131

8 R 4,094,323
10 A 4,094,324
21 R 4,094,325
234 4,094,326

CLASS 132

91 4,094,328

CLASS 134

2 4,094,701
10 4,094,702
56 R 4,094,329

CLASS 135

67 4,094,330
4,094,331

CLASS 136

89 TF 4,094,703
4,094,704

CLASS 137

46 4,094,332
100 4,094,333
219 4,094,334
317 4,094,335
403 4,094,327
505.42 4,094,337
512.1 4,094,336
578 4,094,338
604 4,094,339
625.66 4,094,340

CLASS 139

159 4,094,341

CLASS 140

93.2 4,094,342

CLASS 141

86 4,094,343
125 4,094,344
174 4,094,345
286 4,094,346
313 4,094,347

CLASS 144

34 F 4,094,348

CLASS 145

31 B 4,094,349
50 D 4,094,350

CLASS 148

2 4,094,705
11.5 F 4,094,706
12 R 4,094,707
32.5 4,094,708
126 4,094,709

CLASS 149

3 4,094,710
4 4,094,711
10 4,094,712
36 4,094,713
88 4,094,714

CLASS 150

7 4,094,351

CLASS 151

37 4,094,352

CLASS 152

310 4,094,353
361 R 4,094,354

CLASS 156

78 4,094,715
87 4,094,716
197 4,094,717
210 4,094,718
250 4,094,719
304 4,094,720
309 4,094,721
345 4,094,722
353 4,094,723
384 4,094,724
497 4,094,725
502 4,094,726
505 4,094,727
514 4,094,728
515 4,094,729
606 4,094,730
616 R 4,094,731
643 4,094,732
648 4,094,733

CLASS 159

13 A 4,094,734

CLASS 162

76 4,094,735
175 4,094,736

CLASS 165

1 4,094,355
39 4,094,356
105 4,094,357
154 4,094,358

CLASS 166

65 R 4,094,359
243 4,094,360

CLASS 169

48 4,094,361

CLASS 172

120 4,094,362
349 4,094,363

CLASS 173

80 4,094,364
117 4,094,365
138 4,094,366

CLASS 174

23 C 4,095,039
28 4,095,040
4,095,041
36 4,095,042
65 R 4,095,043
138 F 4,095,044

CLASS 176

65 4,094,737
67 4,094,738

CLASS 177

1 4,094,367
128 4,094,368
147 4,094,369
168 4,094,370
210 R 4,094,371

CLASS 178

2 R 4,095,045
22 4,095,046
69.1 4,095,047
4,095,048

CLASS 179

1 GQ 4,095,049
2 A 4,095,050
15 AF 4,095,053
15 AS 4,095,052
15 BS 4,095,051
18 DA 4,095,056
18 ES 4,095,054
18 GF 4,095,055
175.1 A 4,095,057
175.2 D 4,095,058

CLASS 180

1 F 4,094,373
1 G 4,094,372
31 4,094,374
33 A 4,094,375
43 R 4,094,376
65 C 4,094,377
105 E 4,094,378

CLASS 181

284 4,094,379
285 4,094,380

CLASS 182

67 4,094,381

CLASS 184

15 R 4,094,382
55 A 4,094,383
4,094,384

CLASS 187

29 R 4,094,385
4,094,386

CLASS 188

1 B 4,094,387
71.9 4,094,388
73.3 4,094,389
196 D 4,094,390

CLASS 190

18 A 4,094,391
41 R 4,094,392

CLASS 192

82 T 4,094,393
98 4,094,394
106.2 4,094,395

CLASS 194

1 M 4,094,396
10 4,094,398

CLASS 195

7 4,094,739
27 4,094,740
29 4,094,741
33 4,094,742
63 4,094,743
4,094,744
103.5 M 4,094,745

CLASS 198

535 4,094,399
607 4,094,400
827 4,094,401
847 4,094,402

CLASS 200

5 B 4,095,059
16 D 4,095,060
48 KB 4,095,061
61.13 4,095,062
4,095,063
61.21 4,095,064
63 R 4,095,065
67 A 4,095,066
67 AA 4,095,067
144 AP 4,095,068
148 B 4,095,069
153 J 4,095,070
157 4,095,071
4,095,072
293 4,095,073
295 4,095,074
308 4,095,075

CLASS 201

5 4,094,746

CLASS 202

173 4,094,747

CLASS 203

88 4,094,748

CLASS 204

25 4,094,749
56 R 4,094,750
80 4,094,751
105 R 4,094,753
108 4,094,754
129.95 4,094,752
149 4,094,755
159.18 4,094,756
4,094,757
164 4,094,758
180 G 4,094,759
181 R 4,094,760
192 EC 4,094,762
192 M 4,094,761
192 P 4,094,763
298 4,094,764

CLASS 206

45.13 4,094,403
45.15 4,094,404
423 4,094,405
432 4,094,406
524.3 4,094,407
534 4,094,408
566 4,094,409
586 P 4,094,909

CLASS 208

8 4,094,765
10 4,094,766
11 LE 4,094,768
11 R 4,094,767
4,094,769
251 R 4,094,770

CLASS 209

4 4,094,771
12 4,094,772
73 4,094,410
97 4,094,411
106 4,094,412
121 4,094,413

CLASS 210

5 4,094,773
12 4,094,774
22 4,094,775
27 4,094,776
32 4,094,777
38 A 4,094,778
38 B 4,094,780
40 4,094,779
54 4,094,781
58 4,094,782
63 R 4,094,783
68 4,094,784
70 4,094,785
101 4,094,786
103 4,094,787
169 4,094,788
188 4,094,789
289 4,094,790
316 4,094,791
321 B 4,094,792
323 R 4,094,793
512 R 4,094,794

CLASS 211

1.3 4,094,414
57.1 4,094,415
71 4,094,416
183 4,094,417

CLASS 214

1 BC 4,094,418
10 4,094,419
35 R 4,094,420
82 4,094,421
145 R 4,094,422
147 G 4,094,423
304 4,094,424
310 4,094,425
338 4,094,426
505 4,094,427
4,094,428

CLASS 215

305 4,094,429

CLASS 219

10.49 R 4,095,076
61 4,095,077
68 4,095,078
69 E 4,095,079
74 4,095,080
76.16 4,095,081
78.15 4,095,082
121 EB 4,095,083
121 LM 4,095,084
123 4,095,085
283 4,095,086
298 4,095,087
345 4,095,088
441 4,095,089
4,095,090

CLASS 220

1.5 4,094,430
23.4 4,094,431
63 R 4,094,432
90.4 4,094,433
90.6 4,094,434
269 4,094,435
315 4,094,436
374 4,094,437

CLASS 221

1 4,094,438
9 4,094,439
12 4,094,440
18 4,094,441
59 4,094,442
63 4,094,443
266 4,094,444

CLASS 222

1 4,094,445
146 HE 4,094,446
4,094,447
342 4,094,448
475 4,094,449

CLASS 224

2 B 4,094,450

CLASS 225

96 4,094,451

CLASS 226

34 4,094,452

CLASS 228

265 4,094,453

CLASS 229

15 4,094,454
4,094,455
17 SC 4,094,456
21 4,094,457
39 R 4,094,458
41 B 4,094,459
43 4,094,460

CLASS 233

40 4,094,461

CLASS 235

92 GT 4,095,093
92 PK 4,095,092
304.1 4,095,094
419 4,094,462
4,095,095
462 4,095,091
463 4,095,096

CLASS 236

82 4,094,463

CLASS 239

17 4,094,464
112 Re.29,665
132.3 4,094,465
145 4,094,466
230 4,094,467
394 4,094,468
405 4,094,469

CLASS 241

46 R 4,094,470

CLASS 242

18 PW 4,094,471
54 R 4,094,472
55 4,094,473
56.2 4,094,474
107.4 A 4,094,475
125.2 4,094,476
152.1 4,094,477
192 4,094,478

CLASS 244

179 4,094,479
180 4,094,480
194 4,094,481

CLASS 248

4 4,094,482
73 4,094,483
162 4,094,484
221.3 4,094,485
225.4 4,094,486
231 4,094,487
359 4,094,488
429 4,094,489
489 4,094,490

CLASS 249

83 4,094,491

CLASS 250

199 4,095,097
205 4,095,098
4,095,099
206 4,095,100
227 4,095,101
265 4,095,102
277 CH 4,095,103
311 4,095,104
338 4,095,105
358 R 4,095,106
363 S 4,095,107
369 4,095,108
374 4,095,109
445 T 4,095,110
476 4,095,111
492 A 4,095,112
494 4,095,113
510 4,095,114
538 4,095,115
551 4,095,116
564 4,095,117

CLASS 251

212 4,094,492

CLASS 252

8.55 D 4,094,798
8.55 R 4,094,795
8.8 4,094,796
8.9 4,094,797
29 4,094,799
32.7 E 4,094,800
33 4,094,801
51.5 A 4,094,802
62.1 P 4,094,803
62.52 4,094,804
70 4,094,805
102 4,094,806
131 4,094,807
186 4,094,808
301.1 W 4,094,809
313 R 4,094,810
4,094,811
321 4,094,812
373 4,094,813
415 4,094,814
4,094,815
4,094,816
4,094,817
429 C 4,094,818
435 4,094,819
465 4,094,820
466 PT 4,094,821
512 4,094,822
522 4,094,823
4,094,824

CLASS 254

144 4,094,493

CLASS 260

2 S 4,094,825
2.2 R 4,094,826
2.5 AC 4,094,827
2.5 AK 4,094,829
2.5 AM 4,094,828
2.5 AW 4,094,869
2.5 B 4,094,685
4 R 4,094,830
5 4,094,831
17.4 GC 4,094,832
4,094,833
19 UA 4,094,834
22 A 4,094,837
22 CB 4,094,835
4,094,836
22 TN 4,094,838
23 R 4,094,839
29.2 N 4,094,843
29.2 TN 4,094,842
29.3 4,094,844
29.4 R 4,094,846
4,094,847
29.4 UA 4,094,845
29.6 E 4,094,848
29.6 H 4,094,841
29.6 MQ 4,094,849
31.8 PQ 4,094,850
33.6 UA 4,094,851
37 N 4,094,852
40 R 4,094,853
42.46 4,094,854
45.75 B 4,094,858
45.8 NT 4,094,855
45.9 NP 4,094,856
45.9 QB 4,094,857
47 P 4,094,861
47 R 4,094,859
4,094,860
65 4,094,862
77.5 B 4,094,863
78 R 4,094,866
78 TF 4,094,864
78.41 4,094,865
79.3 M 4,094,867
192 4,094,868
239 BD 4,094,870
239.3 B 4,094,871
239.55 R 4,094,840
270 PD 4,094,876
270 PY 4,094,875
293.58 4,094,877
297 Z 4,094,878
299 4,094,879
302 SD 4,094,880
306.8 R Re.29,668
308 A 4,094,881
343 4,094,882
343.6 4,094,883
4,094,884
345.5 4,094,885
345.9 P 4,094,886
346.11 4,094,887
346.75 4,094,888
348.34 4,094,889
397.2 4,094,890
410.9 R 4,094,892
413 4,094,891
429 R 4,094,893
453 SP 4,094,894
455 A 4,094,895
456 A 4,094,896
513 B 4,094,898
514 D 4,094,899
520 E 4,094,900
530 R 4,094,901
551 P 4,094,902
555 A 4,094,903
558 A 4,094,904
561 R 4,094,905
566 B 4,094,906
570 D 4,094,907
570 R 4,094,908
613 B 4,094,910
615 A 4,094,911
656 R 4,094,915
666 A 4,094,916
4,094,917
668 A 4,094,919
668 R 4,094,918
4,094,920
671 C 4,094,921
4,094,922
683.48 4,094,923
683.51 4,094,924
836 4,094,925
860 4,094,926
897 B 4,094,927
944 4,094,928
968 4,094,929

CLASS 261

18 A 4,094,930
23 B 4,094,931
41 D 4,094,932
50 A 4,094,933
64 R 4,094,934
80 4,094,935
96 4,094,936
111 4,094,937

CLASS 264

30 4,094,938
35 4,094,939
40.6 4,094,940
71 4,094,941
102 4,094,942
105 4,094,897
130 4,094,943
137 4,094,944
171 4,094,946
4,094,947
184 4,094,945
206 4,094,948
234 4,094,949
259 4,094,950
325 4,094,951
328 4,094,952

CLASS 266

44 4,094,494
142 4,094,496
143 4,094,495

CLASS 269

71 4,094,497

CLASS 270

52.5 4,094,498
60 4,094,499
79 4,094,500

CLASS 272

8 M 4,094,501
74 4,094,502
85 4,094,503

CLASS 273

29 A 4,094,504
73 C 4,094,505
85 R 4,094,506
110 4,094,507
118 R 4,094,508
247 4,094,509
251 4,094,510

CLASS 274

39 A 4,094,511

CLASS 277

27 4,094,512
41 4,094,513
92 4,094,514
4,094,515
4,094,516
94 4,094,517
95 4,094,518
134 4,094,519
166 4,094,520

CLASS 279

4 4,094,521
4,094,522
62 4,094,523

CLASS 280

11.2 4,094,524
4,094,525
47.35 4,094,526
414 R 4,094,527
610 4,094,528
614 4,094,529
625 4,094,530
649 4,094,531
695 4,094,532
745 4,094,533
760 4,094,534

CLASS 285

7 4,094,535
21 4,094,536
47 4,094,537
150 4,094,538
309 4,094,539

CLASS 290

2 4,095,118
40 R 4,095,119
44 4,095,120

CLASS 292

214 4,094,540
231 4,094,541
256.5 4,094,542

CLASS 294

54 4,094,543
82 R 4,094,544

CLASS 296

28 C 4,094,545
28 M 4,094,546

CLASS 297

182 4,094,547

CLASS 299

9 4,094,548
17 4,094,549

CLASS 301

37 R 4,094,550

CLASS 302

26 4,094,551
29 4,094,552

CLASS 303

3 4,094,553
52 4,094,554
100 4,094,555
109 4,094,556

CLASS 305

54 4,094,557

CLASS 307

88.3 4,095,121
4,095,122
115 4,095,123
141.4 4,095,124
234 4,095,125
237 4,095,126
253 4,095,127
254 4,095,128

CLASS 308

3 R 4,094,558
194 4,094,559
206 4,094,560

CLASS 310

49 R 4,095,129
162 4,095,130
239 4,095,131

CLASS 312

223 4,094,561
290 4,094,562

CLASS 313

103 CM 4,095,132
336 4,095,133
470 4,095,134
493 4,095,135

CLASS 315

11 4,095,136
13 C 4,095,137
16 4,095,138
153 4,095,139
199 4,095,140
241 P 4,095,141
248 4,095,142
370 4,095,143
375 4,095,144
383 4,095,145

CLASS 316

19 4,094,563

CLASS 318

7 4,095,146
52 4,095,147
138 4,095,148
220 A 4,095,149
227 4,095,150
266 4,095,151
376 4,095,152
4,095,153
4,095,154
541 4,095,155
571 4,095,156
603 4,095,157
4,095,158
605 4,095,159
675 4,095,160
696 4,095,161

CLASS 320

1 4,095,162

CLASS 323

8 4,095,163
4,095,164
17 4,095,165
4,095,166

CLASS 324

0.5 AH 4,095,168
3 4,095,167
8 4,095,169
16 T 4,095,170
33 4,095,171
51 4,095,172
52 4,095,173
4,095,174
57 R 4,095,175
65 CR 4,095,176
164 4,095,177
169 4,095,178
207 4,095,179
233 4,095,180
238 4,095,181

CLASS 325

17 4,095,182
4,095,183
22 4,095,184

CLASS 328

55 4,095,185
133 4,095,186

CLASS 329

50 4,095,187

CLASS 330

84 4,095,188
265 4,095,189

CLASS 331

2 4,095,190
4 4,095,191
78 4,095,192
94.5 G 4,095,193
108 D 4,095,194
116 R 4,095,195

CLASS 332

16 T 4,095,196

CLASS 333

28 R 4,095,197
32 4,095,198
70 R 4,095,199

CLASS 335

193 4,095,200
210 4,095,201
213 4,095,202

CLASS 336

20 4,095,203
57 4,095,204
92 4,095,205
96 4,095,206

CLASS 337

20 4,095,207
125 4,095,208

CLASS 338

174 4,095,209
180 4,095,210

CLASS 339

14 L 4,094,564
14 P 4,094,565
14 R 4,094,566
15 Re.29,666
4,094,567
17 LM 4,094,568
40 4,094,569
75 M 4,094,570
91 R 4,094,571
97 P 4,094,572
176 MP 4,094,573
177 E 4,094,574

CLASS 340

147 MD 4,095,239
224 4,095,211
4,095,212
252 R 4,095,213
258 C 4,095,214
311 4,095,215
324 AD 4,095,216
324 R 4,095,217
347 DA 4,095,218
347 NT 4,095,219
409 4,095,220
421 4,095,221

CLASS 343

7 A 4,095,222
7.9 4,095,223
17.1 R 4,095,224
17.2 PC 4,095,225
105 R 4,095,226
700 MS 4,095,227
704 4,095,228
715 4,095,229
729 4,095,230
846 4,095,231

CLASS 346

75 4,095,232
4,095,233
4,095,234
110 R 4,095,235
139 C 4,095,236
140 R 4,095,237
4,095,238
163 4,095,240

CLASS 350

3.67 4,094,575
3.71 4,094,576
3.72 4,094,577
96.15 4,094,578
96.17 4,094,579
96.21 4,094,580
150 4,094,581
162 SF 4,094,584
175 E 4,094,585
184 4,094,586
4,094,587
215 4,094,588
241 4,094,589
269 4,094,590
289 4,094,591
333 4,094,582
358 4,094,583

CLASS 351

30 4,094,592
38 4,094,593

CLASS 352

91 C 4,094,594
180 4,094,595

CLASS 353

27 R 4,094,596
35 4,094,597
76 4,094,598
96 4,094,599
120 4,094,600

CLASS 354

31 4,095,241
33 4,095,242
60 L 4,095,243
82 4,095,244
141 4,095,245
187 4,095,246
286 4,095,247
288 4,095,249
293 4,095,250

CLASS 355

3 R 4,094,606
26 4,094,601
40 4,094,602
64 4,094,603
68 4,094,604
95 4,094,605

CLASS 356

85 4,094,607
97 4,094,608
201 4,094,609

CLASS 357

23 4,095,251
43 4,095,252
81 4,095,253

CLASS 358

4 Re.29,670
11 4,095,254
17 4,095,255
35 4,095,256
113 4,095,257
120 4,095,258
141 4,095,259
248 4,095,260
288 4,095,248

CLASS 360

13 4,095,261

CLASS 361

1 4,095,262
274 4,095,264
292 4,095,263

CLASS 364

200 4,095,265
4,095,266
4,095,267
4,095,268
4,095,269
4,095,270
434 4,095,271
497 4,095,272
705 4,095,273
715 4,095,274
721 4,095,275
724 4,095,276
900 4,095,277
4,095,278

CLASS 365

29 4,095,279
112 4,095,280
156 4,095,281
204 4,095,282
230 4,095,283

CLASS 366

7 4,095,284
23 4,095,285
194 4,095,287
219 4,095,288
293 4,095,286

CLASS 400

161.4 4,094,397

CLASS 401

195 4,094,610

CLASS 403

14 4,094,611

CLASS 408

92 4,094,612

CLASS 415

17 4,094,613
28 Re.29,667

CLASS 416

140 4,094,614
215 4,094,615

CLASS 417

121 4,094,616
295 4,094,617

CLASS 418

178 4,094,618

CLASS 423

2 4,094,953
69 4,094,954
123 4,094,955
179 4,094,956
223 4,094,957
238 4,094,958
359 4,094,959
456 4,094,960
564 4,094,961
573 R 4,094,962

CLASS 424

1 4,094,963
4,094,964
1.5 4,094,965
5 4,094,966
28 4,094,967
46 4,094,968
78 4,094,969
4,094,970
92 4,094,971
105 4,094,972
177 4,094,973
200 4,094,974
216 4,094,975
228 4,094,976
240 4,094,977
246 4,094,978
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250 4,094,980
257 4,094,981
263 4,094,982
266 4,094,983
269 4,094,984
270 4,094,985
4,094,986
274 4,094,987
277 4,094,988
282 4,094,989
285 4,094,990
309 4,094,991
324 4,094,992
337 4,094,993
341 4,094,994
353 4,094,995

CLASS 425

135 4,094,619
140 4,094,620
190 4,094,621
224 4,094,622
227 4,094,623
434 4,094,624

CLASS 426

115 4,094,996
533 4,094,997
535 4,094,998
547 4,094,999
656 4,095,000
4,095,001

CLASS 427

27 4,095,002
34 4,095,003
74 4,095,004
376 B 4,095,005
427 4,095,006

CLASS 428

113 4,095,007
215 4,095,008
310 4,095,009
375 4,095,010
469 4,095,011
474 4,095,012
522 4,095,013
658 4,095,014

CLASS 429

15 4,095,015

CLASS 431

9 4,094,625
202 4,094,632

CLASS 432

58 4,094,626
59 4,094,627
80 4,094,628
98 4,094,629
118 4,094,633
134 4,094,630
176 4,094,631

CLASS 526

1 4,095,031
11.1 4,095,032
90 4,095,033
137 4,095,016
188 4,095,017
211 4,095,018
215 4,095,019

CLASS 528

494 4,095,020

CLASS 542

422 4,095,023

CLASS 544

22 4,095,021
26 4,094,872
49 Re.29,669
87 4,095,022
243 4,094,873
258 4,094,874

CLASS 548

367 4,095,024
378 4,095,025
379 4,095,026

CLASS 560

18 4,095,027
44 4,095,028
87 4,095,029
100 4,095,030
121 4,095,036
134 4,095,034
180 4,095,035
246 4,095,037
255 4,095,038

CLASS 568

778 4,094,913
802 4,094,912
862 4,094,914

CLASSIFICATION OF DESIGNS

D2—	292	248,126		154	248,136		224	248,148	D15—	100	248,159	D29—	7	248,170			248,181
	320	248,127		170	248,138	D10—	40	248,149	D16—	38	248,160	D31—	5	248,171	D48—	2	248,182
	400	248,128		177	248,139		56	248,150	D23—	166	248,161	D34—	2 R	248,172			248,183
D6—	37	248,129		181	248,140		116	248,151			248,162		4 R	248,173		4 A	248,185
	56	248,130		201	248,141		120	248,152	D24—	1.1	248,163			248,174		4 B	248,184
	63	248,131	D7—	87	248,142	D11—	152	248,153		21	248,164			248,175		38	248,186
	71	248,132		140	248,143		167	248,154		28	248,165			248,176	D56—	1 C	248,187
	86	248,133	D8—	14	248,144	D12—	92	248,155		29	248,166			248,177	D87—	3 C	248,189
		248,134		344	248,145		169	248,156			248,167			248,178		5 G	248,188
	87	248,135		363	248,146	D13—	40	248,157		54	248,168		5 GC	248,179		8	248,190
	146	248,137	D9—	189	248,147	D14—	94	248,158	D28—	13	248,169		5 GH	248,180			

CLASSIFICATION OF PLANTS

P.—		4,265		9	4,264		36	4,263		68	4,262						

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

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Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
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Delaware	10	Montana	30	Vermont	50
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Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,094,069		4,094,337		4,095,210		4,094,718		4,094,373		4,095,089
	4,094,168		4,094,371		4,095,217		4,094,857		4,094,393		4,095,090
	4,094,300		4,094,372		4,095,227		4,094,894		4,094,395		4,095,103
	4,094,945		4,094,374		4,095,230		4,094,985		4,094,403		4,095,138
4 :	4,094,045		4,094,429		4,095,239		4,095,009		4,094,415		4,095,147
	4,094,067		4,094,435		4,095,248		4,095,019		4,094,426		4,095,170
	4,094,281		4,094,478		4,095,250		4,095,031		4,094,431		4,095,178
	4,094,336		4,094,483		4,095,252	11 :	4,094,845		4,094,442	18 :	4,094,216
	4,094,433		4,094,492		4,095,274	12 :	4,094,159		4,094,449		4,094,348
	4,094,479		4,094,498		4,095,288		4,094,166		4,094,456		4,094,981
	4,094,481		4,094,524	8 :	4,094,020		4,094,227		4,094,458		4,095,003
	4,094,508		4,094,532		4,094,126		4,094,288		4,094,463		4,095,209
	4,094,610		4,094,537		4,094,149		4,094,303		4,094,473	19 :	4,094,042
	4,094,761		4,094,539		4,094,311		4,094,308		4,094,501		4,094,497
	4,094,939		4,094,541		4,094,320		4,094,319		4,094,506		4,094,557
	4,095,124		4,094,562		4,094,335		4,094,377		4,094,507		4,094,574
5 :	4,094,041		4,094,569		4,094,392		4,094,414		4,094,514	20 :	4,094,427
	4,094,096		4,094,573		4,094,491		4,094,423		4,094,516		4,094,428
	4,094,329		4,094,599		4,094,616		4,094,434		4,094,519		4,094,983
	4,094,482		4,094,603		4,094,633		4,094,472		4,094,542	21 :	4,094,397
	4,094,488		4,094,608		4,094,749		4,094,503		4,094,544	22 :	4,094,197
	4,095,185		4,094,662		4,094,754		4,094,560		4,094,546		4,094,295
6 :	Re.29,664		4,094,663		4,094,767		4,094,566		4,094,613		4,094,340
	4,094,014		4,094,697		4,094,769		4,094,639		4,094,631		4,094,416
	4,094,021		4,094,711		4,094,935		4,094,673		4,094,644		4,094,455
	4,094,026		4,094,712		4,095,097		4,094,856		4,094,645		4,094,459
	4,094,027		4,094,713		4,095,235		4,094,967		4,094,648		4,094,765
	4,094,043		4,094,750	9 :	Re.29,667		4,095,077		4,094,674	24 :	4,094,230
	4,094,073		4,094,758		Re.29,668		4,095,148		4,094,678		4,094,304
	4,094,084		4,094,766		Re.29,669		4,095,221		4,094,680		4,094,505
	4,094,085		4,094,770		4,094,024		4,095,275		4,094,694		4,094,581
	4,094,102		4,094,775		4,094,180	13 :	4,094,106		4,094,731		4,094,627
	4,094,112		4,094,792		4,094,191		4,094,164		4,094,779		4,094,646
	4,094,114		4,094,820		4,094,293		4,094,550		4,094,787		4,094,710
	4,094,116		4,094,822		4,094,354	15 :	4,094,317		4,094,790		4,094,717
	4,094,173		4,094,825		4,094,526	16 :	4,094,941		4,094,799		4,094,733
	4,094,175		4,094,873		4,094,559	17 :	4,094,023		4,094,800		4,094,744
	4,094,176		4,094,888		4,094,589		4,094,075		4,094,814		4,094,954
	4,094,189		4,094,895		4,094,596		4,094,083		4,094,816		4,094,973
	4,094,213		4,094,956		4,094,600		4,094,091		4,094,817		4,095,105
	4,094,214		4,094,961		4,094,668		4,094,093		4,094,838		4,095,110
	4,094,225		4,094,974		4,094,846		4,094,104		4,094,850		4,095,222
	4,094,238		4,095,004		4,094,847		4,094,145		4,094,858		4,095,223
	4,094,244		4,095,044		4,094,864		4,094,205		4,094,912		4,095,282
	4,094,263		4,095,058		4,094,866		4,094,209		4,094,913	25 :	4,094,022
	4,094,264		4,095,084		4,094,868		4,094,228		4,094,969		4,094,053
	4,094,271		4,095,098		4,094,899		4,094,233		4,094,998		4,094,063
	4,094,297		4,095,114		4,094,940		4,094,254		4,095,014		4,094,071
	4,094,301		4,095,127		4,095,008		4,094,259		4,095,029		4,094,148
	4,094,315		4,095,136		4,095,045		4,094,309		4,095,061		4,094,192
	4,094,327		4,095,149		4,095,146		4,094,338		4,095,065		4,094,195
	4,094,330		4,095,168		4,095,211		4,094,352		4,095,071		4,094,196
	4,094,332		4,095,193	10 :	4,094,143		4,094,367		4,095,073		4,094,215

4,094,310
4,094,321
4,094,443
4,094,529
4,094,579
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28 : 4,094,095
4,094,647
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29 : 4,094,239
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4,095,107
31 : 4,094,362
4,095,131
32 : 4,094,356
4,095,139
4,094,696
4,095,140
4,094,932
4,095,145
4,094,955
4,095,157
4,095,284
4,095,167
33 : 4,094,451
4,095,175
4,094,485
4,095,207
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26 : 4,094,016
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34 : Re.29,665
4,094,072
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4,095,281
35 : 4,095,121
36 : Re.29,670
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37 : 4,094,328
4,094,413
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39 : 4,094,146
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41 : 4,094,123
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42 : Re.29,666
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